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EXTRA-UTERINE PREGNANCY

EXTRA-UTERINE PREGNANCY

A CLINICAL AND OPERATIVE STUDY

BY

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TO

MY COLLEAGUES OF THE WOMEN'S HOSPITAL,

DR. CLARK, MR. MARTIN, MR. JORDAN AND DR. EDGE,

WITH WHOM I HAVE BEEN SO LONG AND SO

HAPPILY ASSOCIATED

PREFACE.

THE Ingleby Lectures for 1898 have formed the basis of this book. These have been altered and very considerably enlarged, so as to make the present work a fairly comprehensive Manual of Extra-Uterine Pregnancy, written in the light of the most recent knowledge and practice.

The various forms of advanced extra-uterine pregnancy are here, the Author believes, more thoroughly differentiated and explained than in any previous work, and every necessary detail regarding the treatment of tubal mole and peritubal hæmatocele by the operation of posterior vaginal section (according to the author's present practice) is fully entered into.

By far the greater portion of the book has been considered and thought out at the bedside, or in the operating room, or in the museum, but the writings of others have not been neglected, and wherever the Author's conclusions are different from those of writers who have preceded him, the reasons for such conclusions are fully given.

In a recent communication to the Obstetrical Society, Mr. Bland Sutton very thoroughly and generously accepts the conclusions at which the author arrived in his Ingleby Lectures regarding the origin of tubo-abdominal pregnancy. For this the author desires to express his hearty and grateful acknowledgements, the more especially since the "Transactions" appeared too late to make those alterations in the text which such a communication might reasonably demand.

The author desires to express his indebtedness to many of his colleagues, both past and present, who have afforded him opportunities for enlarging his experience or have assisted him in his work. Among the latter he especially thanks the old and valued friend who has transcribed these pages and prepared them for the press.

22 Newhall Street, Birmingham,
April, 1899.

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EXTRA-UTERINE PREGNANCY.

CHAPTER I.

INTRODUCTORY AND HISTORICAL.

ON looking over the whole domain of practical medicine there is perhaps no one disease which, during recent years, has so notably emerged from obscurity into prominence—about which more has been learnt and in the treatment of which more has been achieved—than that of extra-uterine pregnancy.

Some twenty years ago the advance to which I refer received its first impetus from the initial work of Mr. Lawson Tait, and from the remarkable book of Dr. Parry, which was founded on the records of 500 cases, and still remains a model of patient investigation and labour. Although several operations had been undertaken for the removal of an extra-uterine fœtus at or beyond the normal period of gestation, and at least one case of early extra-uterine gestation had been successfully relieved by vaginal section (Dr. Thomas, Feb. 7, 1875, *New York Med. Jour.*, June, 1875) no operative effort had been made at this time to control the hæmorrhage due to rupture of the sac and to save the victim of fatal intra-peritoneal bleeding, and Dr. Parry, when dealing with this condition, wrote in words which have been frequently quoted, but may even still bear repetition:—" A bleeding vessel through which the red stream of life is rushing away can be ligated. A gangrenous limb, which is destroying its possessor by sending its poisonous emanations to the remotest regions of his body, can be amputated. A cancerous breast, which is sapping the vitality of its victim hour by hour, can be removed with the prospect of temporary relief. An aneurism that places life in constant jeopardy, can often be cured by proximal or distal ligation. The tumultuous motion of a heart organically diseased may be quieted till nature restores the balance, after which the person may enjoy a long and even a useful life. Even phthisis now counts its many cures; but here is an accident which may happen to any wife in the most useful period of her existence, which good authorities have said is never cured; and for which, even in this age when science and art boast of such high attainments, no remedy either medical or surgical has been tried with a single success. From the middle of the eleventh century when Albucasis described the first known case of extra-uterine pregnancy, men have doubtless watched the life ebb rapidly from the pale victim of this accident as the torrent of blood is poured into the abdominal cavity, but have never raised a hand to help her. Surely this is an anomaly, and it has no parallel in the whole history of human injuries. The fact seems incredible, for if one life is saved by active interference it may be triumphantly pointed to as the first and only instance of the kind on record. In the whole domain of surgery--for we cannot look to other than surgical measures under the circumstances—there is now left no field like this......The only remedy that can be proposed to rescue a woman under these unfortunate circumstances is gastrotomy—to open the abdomen, tie the bleeding vessels, or to remove the sac entire."

This definite appeal or challenge to surgery for the rational treatment of tubal rupture, written in 1875, and repeated with more or less force by many of the older gynæcologists (who yet lacked the courage to act upon their convictions) was finally taken up by Mr. Tait, who deliberately operated for tubal rupture in 1883.

His practice was soon followed by other surgeons both at home and abroad, and the era of surgical treatment for intra-peritoneal hæmorrhage due to tubal rupture was definitely started. How fertile this has been—how many lives have been saved by this advance in surgical treatment it is almost impossible to estimate; but we know that no important operation of modern surgery has been more successful than this, and the work that has been done has led and is still leading to a better knowledge of the disease, its consequences and complications, so that every few years since this date have brought increase of light, increase of resource, and increase of promise for the future.

The lesions found and specimens removed as a result of operation during the earlier period of gestation soon established the fact that all cases of extra-uterine pregnancy (as Mr. Tait had already contended) were originally tubal or interstitial, and therefore, that the varieties which had been described by former observers could all be traced to a tubal origin. Later, one of these varieties—the sub-peritoneo-pelvic or sub-peritoneo-abdominal form of "broad ligament pregnancy" was very fully investigated and described by Dr. Berry Hart and Mr. Carter, and their monograph remains our standard of reference for the general method in which the peritoneum may be displaced by the growth of this variety and for the actual conditions found in two examples. Later still, Mr. Bland Sutton drew our attention to the condition known as "tubal mole" and "tubal abortion," in which the Fallopian tube affected by the misplaced pregnancy is found to contain an apoplectic ovum instead of a growing fœtus.

Following up these investigations I showed before the Gynæcological Society in 1894 that the abdominal ostium of the tube in these cases commonly remained open, and that intra-peritoneal hæmatocele whenever it was found could usually be traced to the blood-drip from the fimbriated end of a tube in which a mole of pregnancy had formed, the special peculiarities assumed by such hæmatoceles being considered and explained. These observations and conclusions were confirmed by those of Dr. Cullingworth, and the existence of intra-peritoneal hæmatocele—a definite tumour due to intra-peritoneal hæmorrhage—(which had been apparently denied by some authors) has not only been again established, but its special relation to tubal mole and to bleeding from the unruptured tube is now accepted by the best of modern writers.

There are still other points in connection with the subject of extra-uterine pregnancy that demand some further investigation and fuller explanation. One of the most important of these is the exact history and condition of the variety known as abdominal or ventral. That this is a direct secondary development of tubal pregnancy was held by myself in the report of a case which I brought before the Obstetrical Society in 1891, and again before the Gynæcological Society in 1892. It was exhaustively proved also in Dr. Croom's case by the post-mortem examinations and reports of Dr. Clarence Webster; but the cases were of somewhat different type and have failed to leave sufficient impress on the current literature and teaching of the day.

In the course of the following pages I hope to be able not only to show that this abdominal or ventral pregnancy is not—as Mr. Tait and Mr. Bland Sutton have held—a mere secondary result of the broad ligament form; but that it is a variety having only very rarely any connection with broad ligament pregnancy—a variety with subsidiary modifications under one or other of which it is perhaps possible to group all the cases of this kind that have been hitherto recorded.

I shall also endeavour to re-open certain questions connected with my subject which, although more or less dogmatically settled by past observers, appear to my mind to be insufficiently explained and to need for their consideration an open mind and a wider knowledge.

CHAPTER II.

CAUSATION.

EVERY pregnancy is the result of the impregnation of the ovum of the female by the spermatozoon of the male, and the normal place for the development of the impregnated ovum is the cavity of the uterus, while the channel through which the ovum must pass from the ovary in order to gain the uterine cavity is the Fallopian tube. The tube may be regarded as specially fitted to be this channel for the reception and transit of the ovum. The delicate plications of its mucous membrane (seen best when floated under water as in the accompanying illustration) form the lightest and most delicate of resting places, while the innumerable cilia of its epithelium waving always towards the uterus tend to sweep the ovum onwards and outwards. These plications with their waving cilia are not confined to the tube itself but are continued over the border at the fimbriated extremity into the peritoneal cavity, and usually stretch in unbroken line from the tube to the ovary itself. Sometimes this "ovarian fimbria" is remarkably full and broad (as in the figure) while accessory fimbriæ both around the abdominal ostium and on the sides of the broad ligament complete an apparatus for the direction of the ovum which must cause a marked and ceaseless current from the ovary to the tube. Rarely an accessory ostium is found as in the figure. In this way

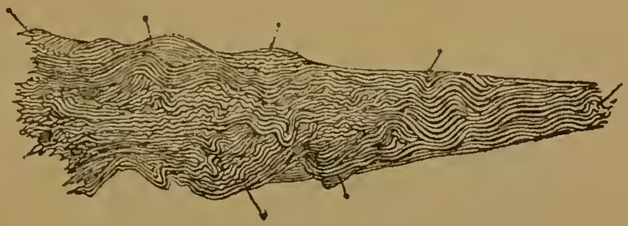

FIG. 1.

the ovum when shed is swept into the abdominal ostium of the Fallopian tube. But when the ovum has entered the tube it may be considered as doubtful whether its progress is continuous and uninterrupted until it enters the uterine cavity. The adult Fallopian tube is convoluted, and at every bend or turn is bound down by fibrous bands beneath the serous covering (see fig. 3). Each of these forms a ridge or elevation within the tube which must be somewhat difficult to pass, and the progress of the ovum is probably retarded at each bend of the tube by the presence of these bands. Whereabouts in its passage does the ovum meet the spermatozoon and become impregnated?

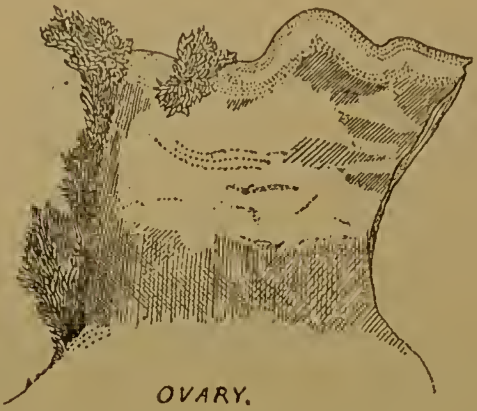

FIG. 2.

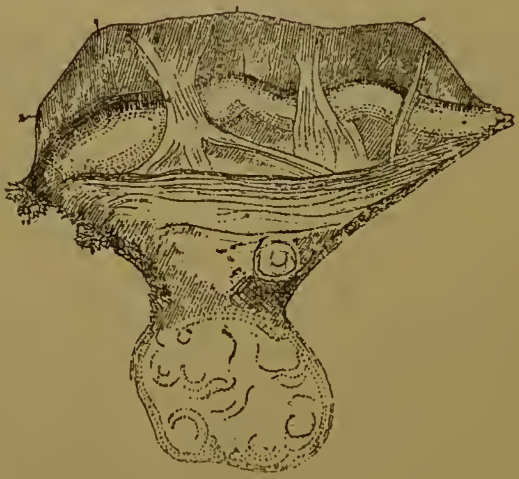

FIG. 3.

Some of the older writers (Dr. Ingleby, 1834) suggested that there was no fixed place where impregnation occurred, but that anywhere during its descent, whether in tube or uterus, it was possible for conception to take place.

More modern writers on the other hand have usually assumed that normal impregnation occurs only in the uterus. Mr. Tait writes, "The uterus alone is the seat of normal conception," and "the function of the ciliated lining of the Fallopian tubes is to prevent spermatozoa from entering them," while Mr. Bland Sutton states, "It is reasonable to believe that fertilization normally happens in the uterus, but when it occurs in the tubes it is accidental, and tubal gestation is the consequence."

The only ground for this belief appears to be the fact that the normal attachment and development of the impregnated ovum is within the cavity of the uterus.

It was formerly held that the direction of the ciliary movement in the uterus was from the cervix to the fundus, while that in the Fallopian tubes was from the fimbriæ to the uterus; therefore that the passage of the spermatozoon was helped by ciliary movement towards the fundus of the uterus while the passage of the ovum was similarly assisted from the fimbriated end of the tube toward the fundus. On this hypothesis it was reasonable to suppose that the fundus was the normal meeting place of the spermatozoon and the ovum, and that here normal impregnation alone took place. But during recent years the direction of ciliary movement within the uterus has been ascertained to be quite otherwise both in animals and women—an examination of the freshly extirpated uterus by Hofmeier proving that the direction of this movement is from the fundus to the cervix, and therefore that its direction throughout, from the fimbriated end of the Fallopian tube to the neck of the uterus, is wholly in a downward and outward direction.*

This being the case, the function of ciliary movement cannot be (as Mr. Tait supposes) to prevent the entrance of spermatozoa or none could enter the uterus. On the contrary, it has been directly proved that the active movements of the spermatozoa are quite sufficient to carry them against the current of ciliary movement, and human spermatozoa have been actually discovered in the Fallopian tubes after extirpation of the appendages (Dührssen).

---

* This has been confirmed by later observations (L. Mandl, *Centralblatt f. Gyn.*, No. 13, 1898).

Many years ago (in 1838) Bischoff and Barry discovered spermatozoa on the surface of the ovaries of bitches some time after copulation (Parry, p. 45). Mr. Tait, referring to these and similar researches on the lower animals writes as follows:—"Spermatozoa have been found high up in the cornua of the bipartite uteri, and these cornua have been erroneously supposed to be Fallopian tubes, whilst they are nothing of the kind. The Fallopian tubes do not really exist save in the higher order of animals who have assumed the upright position." This criticism unfortunately appears to be founded on error. The Fallopian tubes *do* exist in the lower animals and are very perfect structures in the dog and sheep and heifer, as I have proved by personal dissection. That of the dog (or bitch) and sheep may be seen in the accompanying sketches. It proceeds from one side of the cornu of the bipartite uterus (which is otherwise completely closed) and after a winding course over the ovarian chamber—a membranous sac enclosing the ovary—it opens by a well-marked fimbriated extremity within the ovarian chamber itself. Consequently any spermatozoa found on the

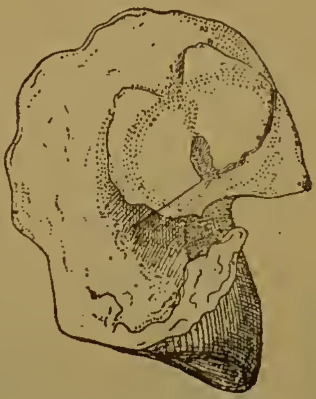

Fig. 4.—Horn of uterus of bitch (recently delivered). Ovarian chamber laid open; Fallopian tube coursing over ovarian chamber; bristle passed into fimbriated end of tube.

surface of the ovary must have passed not only through the cornu of the uterus but through the whole length of the Fallopian tube also.

Dr. Strassmann, who has quite recently collected considerable evidence on the subject of conception, writes as follows: "Fructification, the union of the ovum with the spermatozoon, takes place in the Fallopian tube probably at the fimbriated end, and immediately after the exit of the ovum from the follicle (Bischoff-His). Accordingly, we may draw the conclusion that each pregnancy begins as an extra-uterine one and that an extra-uterine pregnancy is a consequence of retarded movement of the fructified ovum." This probably goes too far. The uterine ostium of the Fallopian tube when contracted cannot favour the ingress of spermatozoa to the tube, and the entrance (or not) of spermatozoa must depend largely on the dilatation (or contraction) of the ostium. Sometimes the passage from the uterus to the abdomen must be very free, and especially so when the cervix is dilated. In six cases Doderlein experimentally injected coloured solutions into the dilated uterus before its removal by vaginal hysterectomy. In all but one of the cases the solution passed into the peritoneal cavity (*Centrabl. für Gynäk.*, 25). On the other hand, the frequent use of intra-uterine injections without abdominal disturbance re-

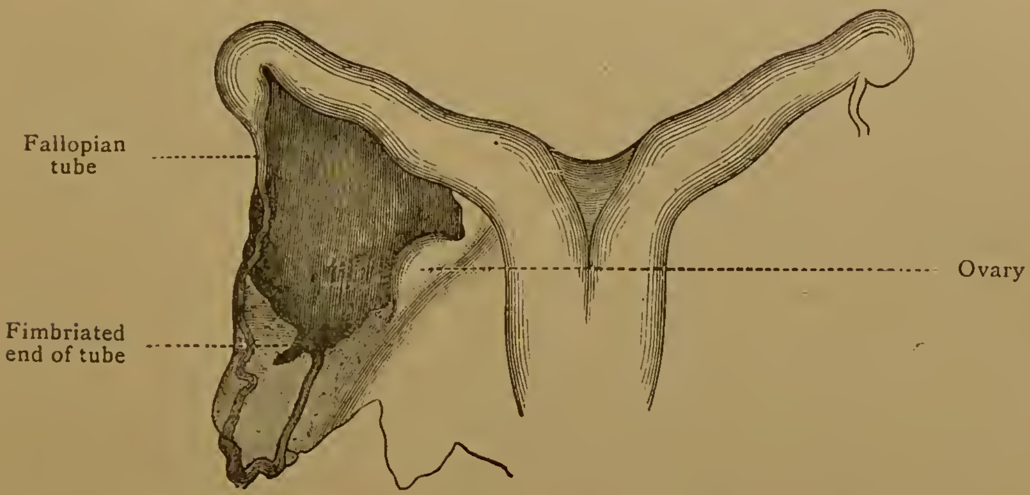

FIG. 5.—Double uterus and Fallopian tube of sheep.

sulting, appears to show that this open and pervious state of the tubes is not a common or invariable condition.

That the normal tube admits the entrance of spermatozoa, but is not the special "receptaculum seminis" seems proved by the researches of Prof. Dührssen, who in his Vaginal Cœliotomies for retroflexion in married women has frequently pressed a cover-glass against the abdominal ostium and examined for spermatozoa. In most of his investigations he met with a negative result, but in some spermatozoa were recognised, although degenerated and motionless. (*Arch. für Gynäk.*, B. 54, H. 2, 297).

The truth evidently lies between the two extremes. We may hold with reason that there is no evidence whatever for the belief that the seat of normal impregnation is *limited* to the cavity of the uterus, while the facts which are known concerning the invasion of the tubes by spermatozoa unmistakably point to the conclusion that normal fructification of the ovum may occur at any stage of its passage from the ovary to the uterus.

But if normal impregnation often occurs within the Fallopian tube, the latter has an important function which at present is altogether disregarded. If the tube has to convey the fructified ovum as well as the unimpregnated ovule into the cavity of the uterus, other forces than the ciliary movement may be necessary, and any mechanical impediment to the delivery of the ovum from the tube into the uterus may be a cause of misplaced pregnancy. The fructified ovum is subject to definite growth (in the 2nd week it is from 3 to 6 mm. in diameter), and though it probably soon passes from the tube into the uterus, it is evident that any want of development in the tube, any permanent contraction, any swelling of the mucous membrane, any abnormal length of tube, any extra weight or impaired mobility of the ovum at its entrance of tube, any failure of muscular power, or any interference with the peristaltic action of the tube, if this be needed for propulsion of the ovum, may increase the tendency towards a tubal instead of a uterine "settling" of the ovum.

It has been objected by Mr. Bland Sutton that tubal pregnancy cannot be explained by obstruction to the transit of ova, because the "öosperm" (fructified ovum) is more often retained in the wide ampullary section of the tube than in its uterine segment, and if delay or stoppage during transit of the fructified ovum always depended on the inadequate size of an otherwise normal tube the criticism would have considerable or even fatal force. This can only be *one* among many cases for delay, and it is probably a rare cause. Still it is interesting to note that in a special class of cases—the cases of early rupture—in which the tube, as we shall see, is ill-developed or somewhat atrophied, it is precisely at this point—or just outside the uterine segment of the tube—that arrest most frequently takes place and the pregnancy develops. On the other hand, at the outer extremity of the tube—near the expanded abdominal ostium—where not infrequently a tubal pregnancy is found, it is evident that a totally different cause or set of causes may account for retarded progress or arrest of the impregnated ovum and and consecutive attachment. Here, the in-going tubal current, which, whether due altogether to the movement of the cilia or not, has been proved experimentally to exist—may lack the power to sweep the öosperm into the lumen of the tube—the ovum itself, if prematurely fertilized, may soon increase in size and weight, and the fimbriated extremity of the open tube may fail to surround or grasp it sufficiently for any muscular (peristaltic) action to be applied to it. That such an action of the tube is possible seems proved by the history of some of the rare cases of so-called "tubal abortion," which occur in this situation. In these cases after attachment of the fructified ovum and some development, and after the size of the ovum has been increased by sub-chorionic bleeding, the tube may contract on its contents—separate the attachments, and extrude or "vomit" the mole of pregnancy out of the tube into the pelvis.

If the tube possesses this reverse action when the conditions are altogether unfavourable for any movement in the ovum, it is surely reasonable to suppose that when the conditions are favourable, when the ovum is smaller and there is no attachment, natural peristalsis occurs in the normal direction from the tube towards the uterus. The activity (or otherwise) of this depending, as it must, not only on the part of the tube involved, but also on the nerve influence and on the development of the muscular coat, cannot fail to have its bearing on the progress of the ovum.

In other cases, perhaps in the majority of cases, the arrest of the fructified ovum is probably determined by swelling of the mucosa. It is in the middle and outer portions of the tube, and not towards the uterine segment, that the wonderful plications of its mucous membrane are most luxuriantly developed, and any source of swelling affecting these would naturally attain the most obstructive power in the central portion of the tube. Such a possible source of obstruction is described in detail by Dr. Webster as produced by the occasional formation of a special swelling and growth in the deeper layers of the tubal mucosa—a swelling which somewhat closely simulates that of the uterine decidua. With perhaps questionable wisdom Dr. Webster speaks of this as the tubal decidua—questionable, for no one has been able to detect in the pregnant tube anything macroscopically approaching to the decidual membrane of the uterus, but there can be no doubt that his sections and specimens, as well as those of some German writers, shew changes in the mucosa of the tube which, whether strictly analogous to those taking place in the uterus at the formation of the decidua or not, do form definite localized swellings which may mechanically arrest the progress of the ovum during its progress down the Fallopian tube.

Mr. Tait and some other writers have held that a pre-existing desquamative salpingitis is the cause of ectopic gestation, and that most cases of extra-uterine pregnancy have a previous history of inflammatory mischief of the uterine appendages. I have not found this in my own experience. In 43 cases no certain evidence could be elicited of any pre-existing inflammation, and the patients were remarkably free from any suspicion of gonorrhœa or syphilis.

In all the operation series I cannot find a single case in which the condition of the appendages was at all suggestive of old gonorrhœal salpingitis, and the well known association of the latter disease with tubal occlusion and sterility tells decidedly against the theory. Mr. Bland Sutton writes:—"In many instances I have failed even after the most careful microscopic examination to find any evidence of old salpingitis or loss of epithelium;" and again, "the evidence now indicates that a healthy Fallopian tube is more likely to become gravid than one that has been inflamed."

Mr. Tait's opinion is avowedly grounded on the theory that the impregnated ovum requires a raw, denuded, or wound-surface for its settling, and that this is normally provided in the uterus through the process of menstruation in which the epithelial coat is shed. Extended consideration and investigation have not tended to confirm our belief in this theory. On the contrary, the more it is considered the greater are the objections which can be urged against it.

As Clarence Webster and Strassmann have pointed out, menstruation is by no means a necessary precursor of pregnancy. Pregnancy may take place in a girl who has never menstruated, in a woman who is suckling and has not menstruated since her "lying-in," in women who have amenorrhœa from other causes, as from chronic phthisis and anæmia. Very occasionally, too, we meet with fertile women who have only very rarely menstruated, and in whom no history of a period is found corresponding to the onset of a pregnancy.

The very facts, or supposed facts, behind the theory are now disputed. It is very questionable whether the epithelium is removed to any extent by the menstruation, and the more recent observations appear to show that no true wound-surface is provided by this process for the engrafting of the ovum.

The *ante-menstrual* period, when the monthly swelling and congestion of the uterine mucous membrane attains its maximum is now with more reason regarded as affording the best conditions for the "settling" of the ovum—in fact, each monthly swelling of the mucous membrane of the uterus may be regarded as the tentative preparation for a possible pregnancy. If the "down-wandering" ovum is fertilised, the swelling increases, a uterine decidua is formed. This catches and embeds the wandering ovum. No menstruation occurs. The woman is pregnant. If, on the other hand, the ovum be not fertilised, the tentative swelling is carried no further, menstruation begins, and the swelling of the uterine mucous membrane dwindles away by and during the process of menstruation. For the time being the chance of pregnancy is lost.

This view is strongly supported by the evidence derived from the current practice of nearly all large gynæcological clinics. If a patient has menstruated within two or three weeks, the sound (if necessary) is passed without hesitation and this without a single known instance of early miscarriage resulting, while if the menstrual period be almost or altogether due, passage of the sound is by no means free from danger in this respect. Instead then, of menstruation fitting the uterus for the reception of the ovum, it is more probably a sign that the fitting period has passed. The period of the *ante-menstrual* swelling, when the sides of the uterus are in apposition is that, I believe, most favourable for the "settling" of the ovum.

If this reasoning be true as regards the uterus, it tends to greatly increase the importance of the researches of those who have detected decidua-like swellings of the tubal mucosa. Whether this tissue has any specific action is probably very questionable, but the swollen mucous membrane may undoubtedly arrest the impregnated ovum and so determine the site of its development.

Very rarely a tubal polypus has been found on the uterine side of a tubal pregnancy. One case of the kind has been recently described in detail by Prof. Dührssen. The little polypus appears to have formed a perfect ball-valve to the uterine end of the tube—the passage of the tube from the uterus to the ovary being free from difficulty—while that from the ovary to the uterus was absolutely stopped by the polypus. On the ovarian side of the polypus the pregnancy had developed (fig. 6).

Again, a tubal pregnancy has been found on the ovarian or outer side of a myoma, the passage into the proper uterine cavity being evidently blocked by the myoma. Dr. Cullingworth has quite recently shown a very valuable specimen of this kind at a meeting of the Obstetrical Society. These cases, although too rare perhaps to warrant any general deductions from them, tend undoubtedly to strengthen the argument of mechanical obstruction as an important factor in causation. Sometimes fixation or stretching of the tube is found in connection with a tubal pregnancy, and then may reasonably be regarded as having been a source of delay or obstruction to the passage of the impregnated ovum.

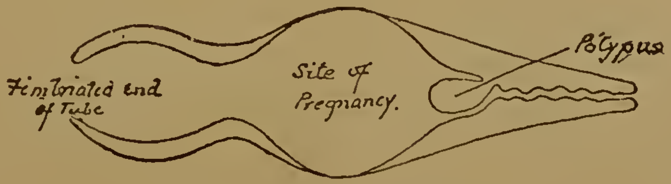

FIG. 6. (After Dührssen).

In three of my cases tubal pregnancy was found associated with ovarian cystomata—one of them a dermoid of considerable size—and in all of these the tube had been fixed or distorted by the growth of the cyst or by accompanying adhesions.

From these considerations it is, I think, reasonable to conclude that some abnormal arrest of the impregnated ovum—whether mechanical or special—in its progress towards the uterus is the determining factor of a misplaced pregnancy. An extra-uterine pregnancy, therefore, is the consequence of the permanent arrest of a fructified ovum in its passage from the ovary to the uterus. Theoretically, this arrest may occur :—

1. In the ovary.
2. In the abdominal cavity between the ovary and tube.
3. Within the tube.
4. Between the tube and uterus.

The first is theoretical only. It is possible, but absolute proof of such a pregnancy seems still to be incomplete. There are, as we shall see, conditions of intra-ligamentary position of the ovum and also of encapsulated hæmatocele around the ovum in both of which the ovary may form part of the outer wall of the sac containing the pregnancy. Later on, this becomes stretched and thin owing to inside pressure from the growing pregnancy, and sections of the sac and outer wall discovering the presence of ovarian tissue may wrongly lead to the conclusion that the pregnancy is ovarian.

The conditions described need careful elimination before any pregnancy can be held to be strictly ovarian in origin.

The second—" Arrest in the abdominal cavity between the ovary and the tube"—is probably always immediately fatal to the unprotected ovum and consequently may be eliminated from discussion.

The third—" Arrest within the tube" is known as " tubal pregnancy."

The fourth point of arrest—between the tube and uterus—may quite as correctly be regarded as arrest in the uterine portion of the Fallopian tube, so that for all intents and purposes we have to do at the outset with one kind only—arrest within the tube, or tubal pregnancy. All other varieties of extra-uterine pregnancy are later developments either of tubal or of uterine pregnancy, and are caused by secondary invasion from the Fallopian tube or uterus of some other tissue or organ. These are conveniently divided into three groups or divisions :—

1. The *tubo-abdominal* or *utero-abdominal* (abdominal or ventral) pregnancy, in which there is secondary invasion of the abdomen.

2. The *tubo-ligamentary* (mesometric or broad ligament pregnancy) in which there is secondary invasion of the broad ligament and sub-peritoneal tissues.

3. The *tubo-uterine* or interstitial pregnancy—in which there is secondary invasion of the uterus. These will be considered in detail after the earlier stages of tubal pregnancy have been dealt with.

CHAPTER III.

TUBAL PREGNANCY: EARLY LIFE-HISTORY.

THE earliest life-history of a growing tubal pregnancy is a matter of inference rather than of actual observation. The specimens of early tubal pregnancy removed by operation have always undergone some change. The tube has ruptured or the ovum has been injured by hæmorrhage, and the exact relations of tube and ovum have become more or less altered. Certain changes, however, are common to nearly all specimens and may be accepted as necessary consequences of the permanent arrest of the fructified ovum. These are the attachment of the ovum, the increased vascularity of the parts affected, and the swelling produced by the growing pregnancy. The tube is small and consequently the ovum is found everywhere surrounded by the mucous membrane of the tube. The ovum is in fact embedded in this, much in the same way as it would normally be in the uterine decidua. Whether there be any true decidual tissue or not, a special zone of mucous membrane differentiates into a potential decidua serotina as in the uterus. Within this zone the chorionic villi develop. Here the ovum becomes attached and rapidly increases in size. As it does so, the tube itself (especially that portion of it where the ovum is situated) and the mesosalpinx adjoining become increasingly vascular. The usual blood vessels become notably enlarged. Sometimes (as in case 23) the ovarian artery is seen to be double its usual size, and the branches of the uterine artery may be similarly dilated. In case 37, which was removed by the vaginal route, the operation being complicated by disease of the uterus necessitating vaginal hysterectomy, seven or eight branches of the uterine artery on the same side as the pregnancy needed ligature instead of the single vessel on the opposite side.

The consequent hyperæmia of the broad ligament and tube is one of the most marked and important of the early changes. It is the source of nourishment to the growing ovum and of whatever compensatory growth and hypertrophy may be attempted toward the strength and stay of the tube containing it. It is also the source of greatest danger. The ovum continues to grow, it distends the tube and soon appears as a globular swelling in the course of the tube—a swelling so characteristic that it is simulated by nothing else except a myoma of the tube. In some specimens an attempt may be traced to increase the substance and strength of the enveloping tube—in other cases this seems to be entirely wanting, and the tube is progressively attenuated by distension from the earliest period of the settling of the ovum. The reasons for the occasional absence of any compensatory hypertrophy are, I believe, to be traced to the primary condition of the tube before the occurrence of the pregnancy, to the part of the tube affected, that part near the uterus being especially feeble in its power of resistance, and, perhaps, to the distribution of the branches of the ovarian artery.

While these changes are taking place in the tube, the uterus has been slightly increasing in size, and a *uterine decidua* has been forming within it. This formation of a decidua appears to be an invariable consequence of pregnancy whether uterine or tubal, and is, therefore, a phenomenon of considerable importance. The fact that a uterine decidua is formed when the pregnancy is extra-uterine shows that its formation does not depend on any direct contact of the ovum with the uterus, but when formed, its fortune is more or less connected with that of the ovum. The death of the ovum or rupture of the tube is often associated with the shedding of the decidua, and the history of the decidua is always of value as bearing upon that of pregnancy. Sometimes it is passed entire, as a perfect cast of the interior of the uterus, (good examples of this kind are figured by Mr. Sutton and Dr. Cullingworth) more frequently it is shed piecemeal, and then, although its passage and the blood-discharge accompanying it may excite the suspicion that a miscarriage is in progress, but little attention is often paid to it by the patient or her friends.

The length of time during which the decidua may remain attached to the uterus is very variable, and depends, as I have said, on the progress of the pregnancy. In one of my cases of early rupture (No. 25) in which the pregnancy was probably of less than four weeks' duration, the decidua was passed a day before the occurrence of the rupture and the intra-abdominal hæmorrhage for which I operated; while in a case that went to term and was operated upon three months after the death of the fœtus the decidua was not discharged until seven or eight weeks after the full period of gestation had been passed. The uterine decidua when passed entire, forms a perfect "cast" of the interior of the uterus, and the thick whitish fibrous, non-vascular membrane of the cast with its three apertures corresponding to the openings of the Fallopian tubes and cervix cannot well be mistaken for anything else. There is, however, no essential difference, so far as I know, between the decidua formed in extra-uterine pregnancy and that which is formed in so-called membranous dysmenorrhœa. The "cast" is usually very much larger in extra-uterine pregnancy, but not necessarily thicker, and it is in the history of the case rather than in the substance passed that one finds reason for differentiation between the two species of the disease. Menstrual deciduæ are always more or less recurrent, and where the passage of one decidual cast has been observed there will almost certainly be the history of others previously passed, and the passage of each of them will coincide with a menstrual period. The passage of a decidua in extra-uterine pregnancy, on the other hand, is an isolated phenomenon, and one which is not co-incident with a normal menstrual period.

When the decidua is passed in shreds with recent blood and blood-clot, the discharge may bear a superficial resemblance to that caused by the early miscarriage of an intra-uterine pregnancy, and a careful microscopical examination may be needed in order to decide on the presence or absence of any fœtal or placental structures. The two surfaces of the decidual membrane are very characteristic. On the one side the membrane is delicately shaggy, and when floated out in water this surface is seen to be covered with hairy filaments like the surface of a mould or fungus. On the other side the surface is quite smooth. The decidua is often passed in two pieces corresponding to the anterior and posterior walls of the uterus.

CHAPTER IV.

TUBAL PREGNANCY *(continued)*.

EARLY RUPTURE OF THE TUBE. TUBAL ATROPHY.

MOST tubal pregnancies are abortive. Some become so at a very early stage, the pregnancy resulting in *early rupture of the tube*. Others grow for a few weeks and then are injured by hæmorrhage from their own vessels, *a tubal mole* forming within the unruptured tube. Others again attain a much greater degree of development and then cause rupture of the tube, perishing in the process either directly from the hæmorrhage and dislocation, or indirectly from the death of the patient or from the hand of the surgeon who removes the pregnancy. These cases will be considered under the heading of *later rupture of the tube*. It is only the minority of cases in which these dangers are averted by some more or less accidental method of growth and of extrusion from the tube, and in which the pregnancy goes to term within the organism of the mother.

Early rupture of the tube from a pregnancy of two to five or six weeks' standing is a special phenomenon of extra-uterine pregnancy which has not as yet received the recognition and consideration it deserves. As a disease or accident it stands quite alone. There is no warning of danger, there are often no physical signs, there is no symptom before that of sudden and copious bleeding, and any history of pregnancy is either altogether wanting or is represented only by an account of menstruation delayed for one week or even less.

A good example of this class of case may be taken from Mr. Tait's book (p. 18).

> "On November 2nd, 1887, at 1.30 p.m., Mrs. —— was seized with pain in the abdomen, followed by vomiting and faintness. Dr. Guthrie Rankin was called in, the pain was relieved by an opiate, but collapse occurred and death ensued at 9 o'clock the same evening. She was the mother of three children,

suckling the youngest aged 7 months, of good constitution, with no history of previous illness. At the post-mortem examination the abdomen was found full of clots, estimated at from seventy to eighty ounces. The left Fallopian tube presented an ovoid swelling which had been ruptured and was full of blood clot. On examination this swelling proved to be a tubal pregnancy—of certainly not more than five weeks. The rupture which caused death was not larger than a pea."

In this case death ensued after an illness of only 7½ hours' duration, the fatal result being exceptionally sudden. The more usual duration is from 12 to 48 hours. Two cases from my own practice will illustrate this portion of my subject.

Mrs. A., aged 33, having one child, six years of age, had been menstruating regularly for upwards of a year until Dec. 23, 1891, this being the date of the last normal period. On Jan. 20 there was a very slight hæmorrhagic discharge, but menstruation did not follow. On Jan. 28 she was troubled with abdominal pain and in the evening she was sick, and the pulse which had been about 80 rose to 120. She passed a fair night, but was again sick in the morning and the pulse rose rapidly to 140. I saw her in consultation with Dr. Bernays at 11.0 a.m. She was then faint and pallid, but fully conscious, with a quick pulse and distended abdomen. A soft doughy mass was to be felt filling the pouch of Douglas behind the uterus. I diagnosed the condition as due to ruptured tubal pregnancy and advised operation.

When this was done, two hours later, the patient's condition had become exceedingly grave. As I opened the abdomen the blood gushed out like the fluid in ascites, and it was evident that the distension of the abdomen had been mainly due to the collection of blood within it. The rupture was found in the left Fallopian tube, which was the seat of an early pregnancy near, but not quite close to, the uterus. The tube was small and atrophic. This with its corresponding ovary was removed. The patient made a good recovery.

Mrs. B., aged 30, having had one child nine years ago, and one miscarriage five years ago, had been menstruating regularly since the date of the miscarriage until some two months before I saw her. The last period had been delayed for one week, but on its appearance was normal in its course. This again had been followed by amenorrhœa of five weeks' standing. On the evening of July 13th, 1895, she had some slight abdominal pain for which she herself attended the consulting rooms of Dr. Shillito. I met him in consultation on the 15th, and found general abdominal distension with vomiting and faintness, marked pallor of the face and lips and a running pulse (150). On examination a doubtful boggy fulness was felt in the pouch of Douglas. The diagnosis was made of tubal rupture. Abdominal section about midnight on the 15th disclosed an early pregnancy of the left tube with linear rupture near the uterus. The appendages were removed. Recovery.

In both of these cases the patients were almost moribund at the time of operation. In the last case the illness was then of 48 hours' standing, in the other of about 16 hours only. In neither case was there any evidence of previous bleeding, nor any symptom before the sudden illness which I have reported.

In these cases of early rupture it is important to notice that but little or no change takes place in the affected tube except at the exact seat of pregnancy and rupture. This may be found at any part in the course of the tube, except at the fimbriated extremity, but its favourite situation is near to the uterus, on the tubal side of the uterine ostium. There is no closure of the abdominal end of the tube and no swelling of the tube except at the site of pregnancy. On the contrary, the condition found on operation appears to show that the tube is often ill-developed and small, the muscular coat defective and the uterine ostium contracted. The remains of the tube enclosing the pregnancy are thin and papery, and there is no evidence whatever of the slightest attempt at any compensatory growth surrounding the affected area. I have operated on four cases of this class, and in all of these the conditions were essentially as here described. In one case the atrophic state of the tube was very marked, and can be still recognised on simple inspection of the specimen. The Fallopian tube in this instance presents the very unusual features of double rupture—having been twice the seat of an extra-uterine pregnancy.

The first tubal pregnancy occurred in 1889. This resulted in rupture with limited hæmorrhage at the sixth week. Peritonitis followed, and a hæmatocele formed which was slowly absorbed after six or seven weeks' rest in bed—the whole of the illness being passed under my own personal observation. Two years later (1891) another pregnancy took place in the same tube, the history of which has already been recorded on page 22 (Mrs. A.).

On examination of the specimen then removed the original rupture of 1889 may be clearly seen surrounded by the remains of old adhesions, while the more recent rupture is marked by protruding blood-clot and membrane near the uterine end of the tube. This end of the tube is notably small and thin, and the slender sheath of muscle tissue in it is almost microscopic. At the site of the pregnancy, just beyond this, no muscular coat can be seen at all, and the black clot of the ruptured pregnancy is everywhere visible beneath the thin peritoneal investment which marks all that remains of the dilated tube in this situation.

The atrophic state of the tube, so well displayed in this specimen, is probably an important factor both in the causation of the disease and in its termination by early rupture. The Fallopian tube has not had the muscular strength necessary to extrude the fructified ovum into the cavity of the uterus, arrest near the uterine end of the tube has been followed by fixation and growth of the ovum, and for want of any substance in the enveloping tube, its necessary expansion has been almost immediately followed by rupture.

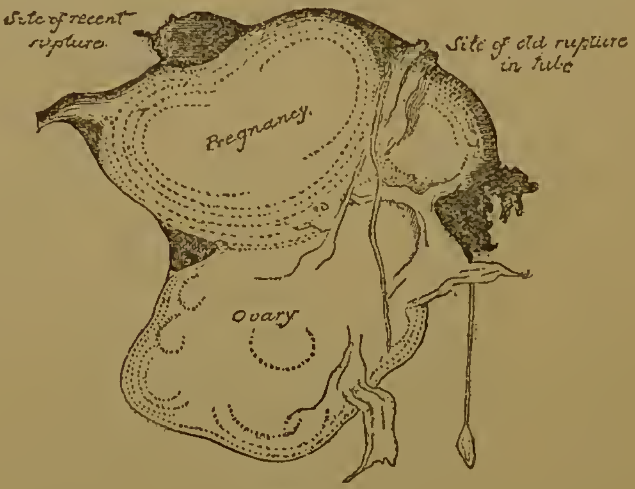

FIG. 7.

Although rarely present perhaps in so marked a degree as in this specimen, it is highly probable that some amount of non-development or atrophy of the tube is responsible for nearly all the cases of early rupture.

The condition may arise as the sequel of a previous pregnancy—some excess of involution affecting both uterus and tubes. In the rare case I have described it may have followed the previous tubal pregnancy, or it may have existed before this date. (I have not the tube of the opposite side with which to compare it). There can be no doubt that the condition is a real one, and that its recognition and consideration will do much at present—and still more, I believe, in the future—to explain the phenomena attending a most important group of ectopic pregnancies.

Other specimens and histories extremely similar to those I have described may be found in our more important museums, and these abundantly show the frequent association of early rupture and diffuse hæmorrhage with pregnancy of the uterine end of an atrophic or ill-developed tube, the course of which is unmarked by any alteration or adhesions except at the site of pregnancy, and the fimbriated end of which is open. As examples I may cite specimen No. 4695 of the Museum of the Royal College of Surgeons, presented by Dr. Walter Lowe, "from a woman aged 33, who, when not aware of being pregnant, was seized with severe abdominal pain and collapse during defæcation. She died within nine hours."

No. 2517^{62} from Guy's Hospital Museum, shows the rupture of an extra-uterine fœtation of the sixth week. The pregnancy is close to the uterus, the coverings are very thin, and the fimbriated end of the tube is unaltered.

No. 2517^{85} is a similar specimen of early rupture. The coverings are very thin. The tube is otherwise unaltered. The rupture is near the uterus. Death occurred in ten hours.

Specimen No. 90 in the Mason College Museum is a very good example. The tube is more like a folded piece of paper than an organ containing muscle-structure (fig. 8). No. 79 in the same museum is probably an example in which both Fallopian tubes were atrophied (fig. 9). The non-pregnant tube is extremely thin and transparent, and there is a rent (accidental ?) near the fimbriated end. The histories of these specimens are not recorded.

Another good specimen is No. 2484 in St. Thomas's Hospital Museum. In this specimen the atrophy of the tubes of both sides is very evident, while the left tube near to its uterine end is the seat of an early pregnancy which has ruptured into the abdominal cavity. The patient died of "fatal peritonitis."

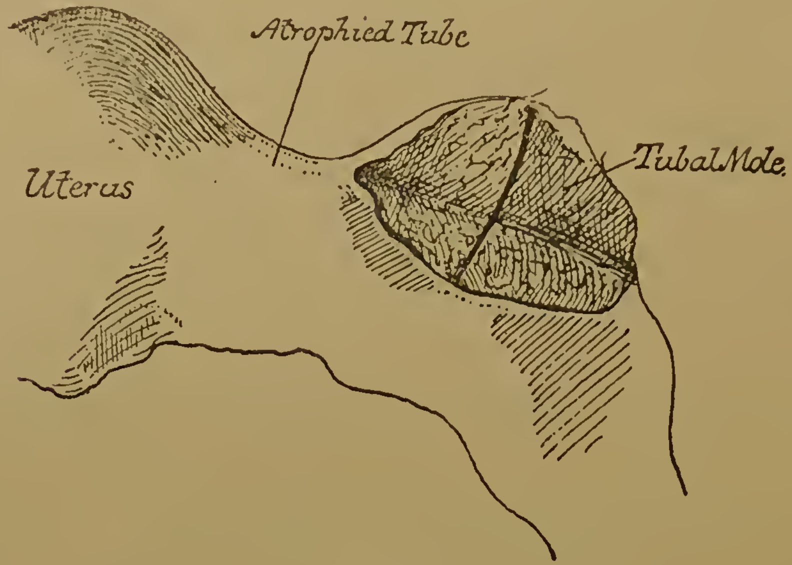

FIG. 8.

Sometimes the condition is found at the very first pregnancy, and then the want of development of the tube is probably congenital.

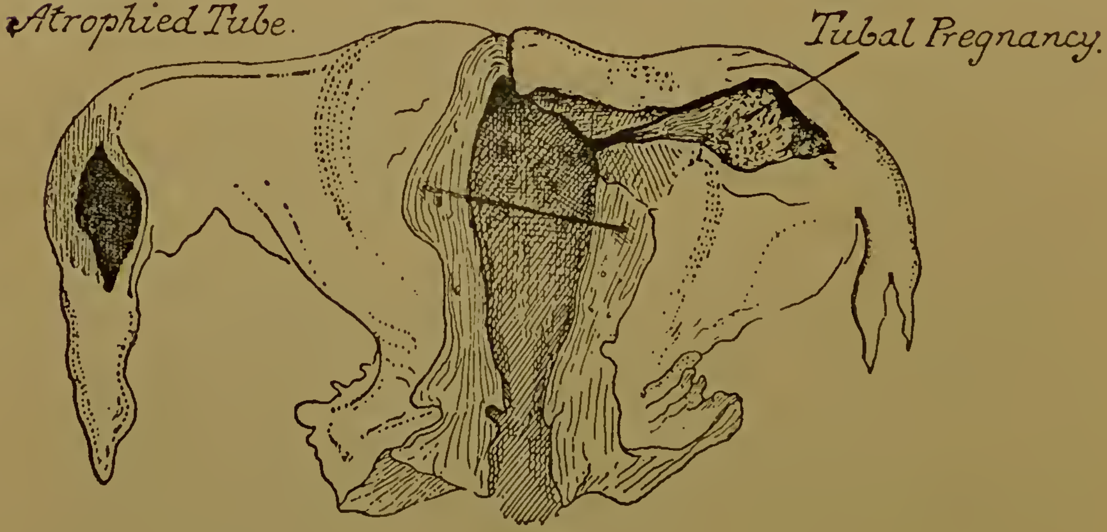

FIG. 9.*

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* Both Fallopian tubes are represented in the sketch as considerably shorter than in the actual specimen.

Mrs. C., aged 30, had been married for seven months. Menstruation had been perfectly regular, the last period occurring four weeks before the date of consultation. Some irregular hæmorrhage had taken place from the vagina for eight days. When seen by me the patient was blanched from hæmorrhage, the abdomen was distended, and on examination the uterus was felt to be surrounded by a soft mass (of blood clot) filling the pouch of Douglas. I opened the abdomen the same evening and found it full of fluid blood and blood clot. The left Fallopian tube was ruptured close to its uterine end and was removed. The covering of the pregnancy was everywhere thin and semi-transparent, and appeared to consist of peritoneal coat only. The patient died during the third week from some slow septic (?) process attended with but little or no rise of temperature and exceedingly difficult to understand. The operation was done in a small house in the country, and the conditions may have been unsuitable and insanitary.

A specimen with very similar history is to be seen in the Museum of the Middlesex Hospital (No. 2050). In this case the rupture is near the fimbriated end of the tube, but the tube is small and ill-developed. The rupture is stated to have occurred at the first pregnancy and only one menstrual period had been passed.

A paper by Prof. Dührssen (*Archiv f. Gynäk.*, B. 54, H. 2), to a very large extent confirms the view I have advanced regarding the association of tubal pregnancy with atrophy of the tube, but Prof. Dührssen limits the causal relationship by only recognising a "puerperal atrophy"—an atrophy of the tube which follows a normal birth and is shortly afterwards again followed by pregnancy within the tube.

It it evident, however, that if an atrophic condition of the tube has any etiological bearing at all, it may well have a wider significance and influence than this.

The very similar condition of the tube resulting from a failure in development receives no notice at Prof. Dührssen's hands, nor has he remarked any relation between atrophy and earliest rupture of the tube. Regarding the fact of tubal atrophy, however, we are in complete accord, and in one of Dr. Dührssen's cases, sections of the Fallopian tube shew a thinning of the wall, a widening of the lumen, a poverty of mucous foldings and large breaks or gaps in the muscle-layer, all of which are plain and unmistakable.

CHAPTER V.

TUBAL MOLE AND TUBAL HÆMATOCELE.

IN a large number of cases pregnancy within the Fallopian tube results in the formation of a tubal mole at a very early stage of gestation. Hæmorrhage occurs (as Mr. Bland Sutton has explained) into the "sub-chorionic chamber" from the circulation of the embryo. In other words blood is poured out into the space between the amnion and chorion, the embryo is injured or destroyed, and a mole of pregnancy results in the same way as it does when a similar accident occurs within the uterus. In a very few cases (one is reported by Mr. Sutton) the mole is extruded from the Fallopian tube into the abdominal cavity, forming a true "tubal abortion." In by far the greater number of cases, however, the "mole" remains strongly attached at one part to the inner surface of the tube. This point of attachment marks the site of what would afterwards have been the placenta if the pregnancy had continued to develop, and some of the specimens of tubal mole afford good opportunities for examination into its usual extent and consistency. The union of tube and ovum is remarkably firm in this situation, but the extent of the union is limited. The mole clings to the tube like a pedunculated polypus, all the circumference of the ovum except at the point of attachment being absolutely free. Until the placental site is differentiated from the rest of the chorion, and attachment is made, the fructified ovum is probably freely movable: as soon as the attachment is formed it steadily increases in strength, and if the pregnancy goes on it is very probably that *no subsequent change will altogether separate the relations of ovum and tube.* This is not only of importance in the later stages of extra-uterine gestation, as we shall see hereafter, but even at this stage the attachment of the mole is a source of serious trouble. For although the pregnancy becomes abortive it does not then become innocuous or quiescent. On the contrary the blighted ovum remains hanging from the inner surface of the tube. It is a source of continuous irritation and hyperæmia in the maternal tissues to which it clings, and is the cause of repeated and dangerous bleedings from the Fallopian tube into the abdominal cavity.

It is true that an attempt is made towards closure of the abdominal ostium of the tube. In acute gonorrhœal salpingitis, as is well-known, this closure is usually complete, but in the sub-inflammatory processes occasioned by tubal mole the salpingitis is much less marked and the closure is incomplete. The tube becomes thickened and more vascular, and at the fimbriated end the ring where peritoneum ceases and mucous membrane begins is subject to a slow contraction that tends to partially confine the blood that is effused within the lumen of the tube. The consequent enlargement and dilatation of the tube on the uterine side of this ring of contraction withdraws some of the fimbriæ back within the tube, but the process rarely proceeds further than this in tubal mole. The abdominal ostium still remains patent, though contracted, and is still marked by a small rosette of fimbriæ on its abdominal aspect.

The external or peritoneal aspect of the tube is marked by a globular swelling corresponding to the situation of the "mole." This, in the removed specimen, is very characteristic. Apart from this, the changes which occur in the tube —in size, shape, position, and mobility—are very much the same as in other cases of tubal enlargement. As a rule, and especially when the pregnancy is situated near the fimbriated end, the enlarged and heavier portion of the tube containing the mole falls directly behind the uterus, rotating somewhat as it does so, and therefore dragging over it and its corresponding ovary the free portion of the broad ligament to which it is attached (mesosalpinx). This takes place very early in the course of the complaint before any bleeding occurs or inflammatory adhesions form. Almost immediately afterwards, however, as we have already seen, bleeding begins both into the tube and from the abdominal ostium, inflammation follows, and the tube becomes increasingly distended and adherent. The tumour which was originally small, strictly posterior in position, moderately mobile and well-defined, slowly extends to one side or the other, and instead of the small well-defined tumour limited to the site of pregnancy we have a complex mass consisting of tube, ovary, broad ligament and blood clot, which tends to fill one side of the pelvis and finally displaces the uterus to the opposite side, pushing the opposite tube and ovary close up against the pelvic wall. The uterus itself is enlarged; a decidua is formed within it, and its consequent increase in bulk tends to accentuate the displacement. An attempt is made in the following sequence of illustrations to roughly depict the changes liable to occur in the tumour occasioned by a tubal mole. In all the uterus and its appendages are sketched as seen from behind.

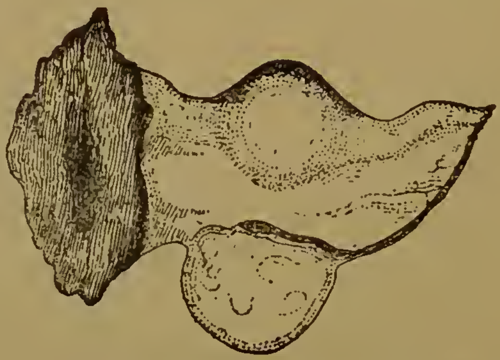

FIG. 10.—To show the "globular swelling corresponding to the situation of the mole." In this specimen—contrary to the usual rule—the fimbriated end of the tube has been widely opened out by the hæmorrhage.

In the first we see the little tumour of the tubal pregnancy before any hæmorrhage has taken place. It is movable, hanging freely in the tube and tends to fall or settle (by its own weight) directly behind the uterus. At this stage it either has no effect at all on the position of the uterus, or tends to drag it backwards and also to displace it slightly toward the same side. In some cases the backward displacement of the uterus is very marked, amounting to decided retroflexion. In others (as in the figure) the retroflexion of the uterus is less marked. It is quite exceptional, however, for the uterus to be anteflexed as it is so often in the early stage of normal pregnancy. The tumour of the pregnancy takes the most dependent position, and the fimbriated end of the tube is tilted up toward the ovary anterior to this and therefore out of sight.

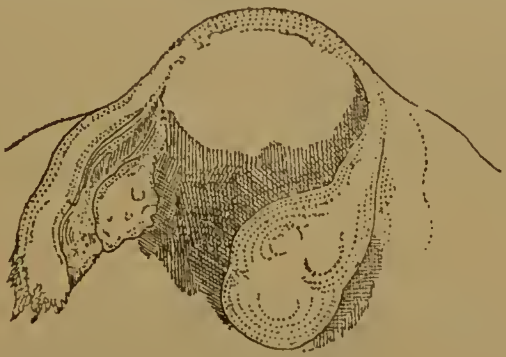

FIG. 11.

In the next figure we see the tube generally distended with blood. The space beneath the mesosalpinx is also filled with blood clot, and blood is escaping into the pouch of Douglas.

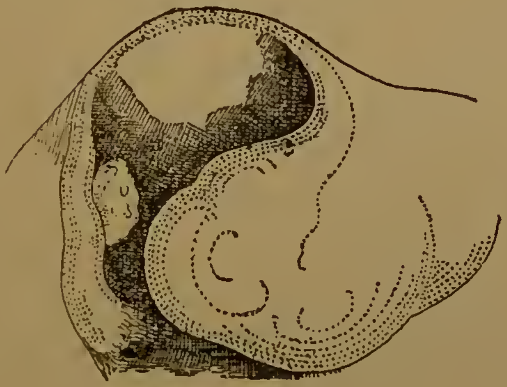

FIG. 12.

The complex tumour formed by the pregnancy—consisting now of the mole of pregnancy, distended tube, adherent ovary, and hæmatocele covered more or less by the mesosalpinx—has become fixed by adhesions—it is extending outwards and upwards. It is beginning to fill the right side of the pelvis, and as it does so it pushes the uterus and opposite appendages decidedly to the left.

In the next illustration, which has been less easy to draw and therefore may be less easy to understand, we see that the uterus has been pushed quite over to the left by the growing mass, so that it must now lie close against the pelvic wall and rectum. Considerable hæmorrhage has taken place beyond and above the limits of the tube, and the tumour formed by this has been roofed in by adhering omentum. The tumour almost fills the pelvis and is extending up into the abdomen above Poupart's ligament.

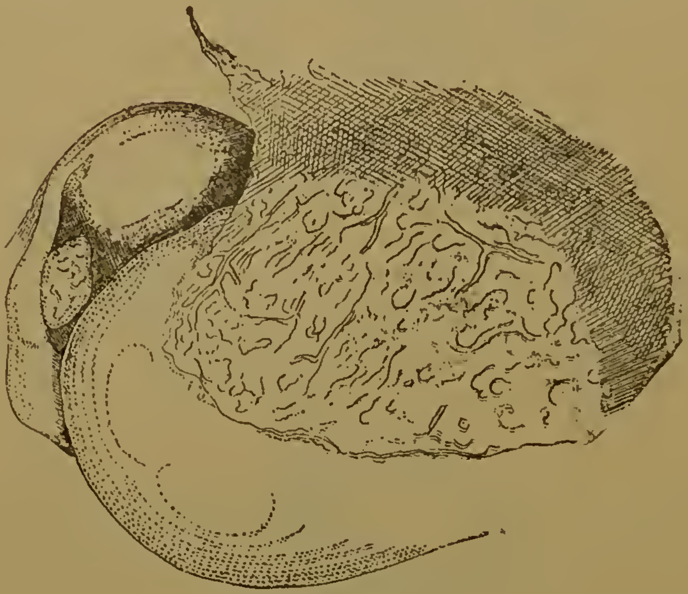

Fig. 13.

If it continues to grow the uterus will be almost buried beneath it.

This tumour (of pregnancy and blood clot) is usually on the same side of the body as the tube containing the pregnancy. But is is not always so. I have known one case (No. 22) in which, although the general configuration of the tumour was very much as I have been describing, the bulk of the tumour was on the opposite side of the body to that of the tube containing the pregnancy.

In this illustration—the last of the sequence—taken from the case I have mentioned, we see the left Fallopian tube crossing the back of the uterus from left to right, lengthened by the growth of the pregnancy and finally terminating in a large right-sided hæmatocele which occupies the right iliac fossa as well as the pouch of Douglas. In other words we have a left tubal pregnancy causing a right iliac hæmatocele. The uterus in this case suffers rather less lateral displacement than in the previous case, but it is strongly displaced forwards, being pressed against the pubes by the tumour behind it. Sometimes, again the tumour is originally lateral in position and remains so throughout, the pouch of Douglas being comparatively empty. The tumour is then closely applied to the upper part of the body of the uterus, moves with it, and may easily be taken for some enlargement of the fundus itself.

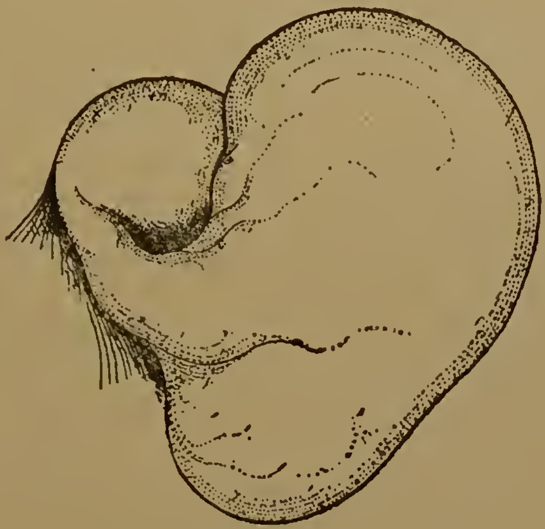

FIG. 14.

Intra-peritoneal hæmatocele, which has been already incidentally referred to and partially described, is a pathological product concerning which much has been learnt during recent years. In women it is almost always caused by tubal pregnancy, sometimes by rupture of the tube and sometimes by bleeding from the fimbriated end of the tube without rupture. The latter is the more common cause of intraperitoneal hæmatocele, and this bleeding from the unruptured tube is usually set up by the presence of a hæmorrhagic mole within it.

Cases of tubal mole with intra-peritoneal bleeding from the open abdominal ostium probably out-number the cases of tubal pregnancy with rupture of the tube; the hæmorrhage, though almost continuous, or frequently repeated, is moderate in amount, and a well defined hæmatocele is the invariable sequel. On the other hand, cases of ruptured tubal pregnancy only sometimes give rise to a definite hæmatocele. In fully half the number of cases the resulting hæmorrhage is "diffuse," no time or opportunity is afforded for the formation of a definite blood tumour, but the hæmorrhage continues until stopped by operation or death. In the remaining cases, where a hæmatocele follows, the latter is often very unstable, subject to sudden and violent alterations from fresh bleeding, so that the resulting tumours may be said to occupy a position midway between intra-peritoneal hæmatocele and diffuse hæmorrhage.

Occasional exceptions to the rule thus formulated are known. For instance, I have met with a case of tubal mole (Case 14) in which the hæmorrhage from the unruptured tube, although it resulted in an intra-peritoneal hæmatocele, was, after recurrence and rupture of the hæmatocele, fully as copious and dangerous as that which I have usually found after later rupture of the tube. And again, I have known at least one case of rupture of the tube (Case 36) to result in a definite and localised hæmatocele in which the bleeding was very moderate and the tumour quite small in size. These exceptional cases, however, do not interfere with the general truth of the statement that rupture of the tube is specially liable to be followed by diffuse bleeding, while hæmorrhage from an unruptured tube containing a mole of pregnancy is the most common cause of intra-peritoneal hæmatocele.

My own statistics on this point are as follows:—Out of 21 cases of intra-peritoneal hæmatocele due to tubal pregnancy (in which the condition of the tube was carefully noted) I find that 14 were due to hæmorrhage from the unruptured tube, while 7 were associated with rupture of the tube.

Dr. Cullingworth's figures are still more striking. He states:—"Of 25 cases of pelvic hæmatocele in which an opportunity occurred of verifying by actual inspection the source of the bleeding, 23 were instances of hæmorrhage from the open abdominal ostium of a pregnant Fallopian tube, and only one was due to rupture."

The formation of the hæmatocele is a process full of interest. Much of this has been already described when treating of the tumour formed by the tubal mole. But when the bleeding has reached beyond the limits of the tube and ovary and uterus—when it invades the abdomen from the pelvis (as in the case figured on page 33), how is it limited and what is the process by which a more or less amorphous mass of blood clot becomes welded or shaped into a definite tumour?

It must be remembered that the living abdomen is always full. Consequently when any blood is effused into the pelvis it is in contact with the pelvic viscera, at first with the tube, the ovary, the turned-in fold of the broad ligament, and the back of the uterus. Later on, omentum and intestine come into contact with the growing blood clot, local peritonitis is set up by hæmorrhage, the pelvic and abdominal viscera become adherent to the surface of the blood clot, and the latter is bounded everywhere by "peripheral adhesions" to surrounding organs. The intra-peritoneal hæmatocele is temporarily formed. But another process is going on besides this. The outer layer of the blood clot consolidates into a more or less perfect sac, and in addition to the adhesions, the blood becomes encapsulated by a limiting layer or outer coat derived from its own substance or tissue. Sometimes the hæmorrhage within this capsule ceases altogether—in process of time the adherent viscera become detached and we may find a perfect sac remaining closely fitting round the abdominal mouth of the Fallopian tube, blood being found within it. This, which I have described elsewhere, is known as encapsulated hæmatocele, and examples of this condition are well seen in the specimens removed from cases 7 and 8. In the specimen from No. 7, the sac of the hæmatocele is altogether independent of the ovary and tube, though the mouth of it is closely applied around the fimbriated end of the tube.* In the specimen from No. 8, the ovary is incorporated with the wall of the hæmatocele while a mole of pregnancy is visibly distending the unruptured tube. In the figure, the tube has been withdrawn from the inside of the sac in order to show that it is uninjured and intact, but before the separation of the tube from the sac the latter in this case formed

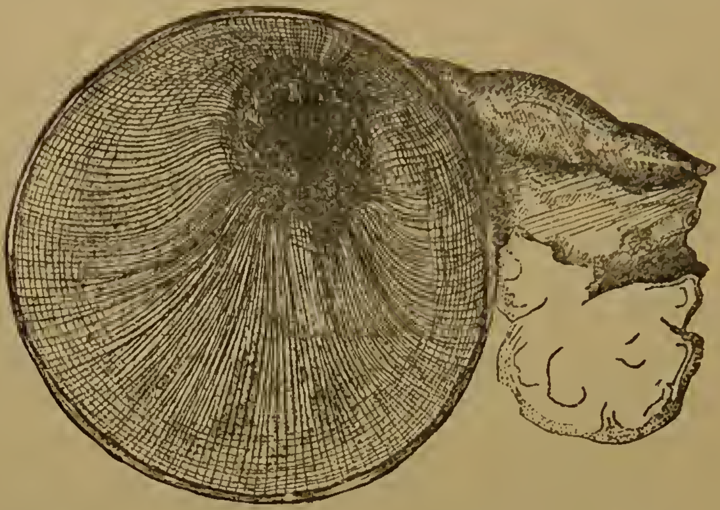

Fig. 15.—Hæmatocele capsule looked at from within—showing fimbriated end of tube in position. The rest of the tube and ovary are seen to be unaltered.

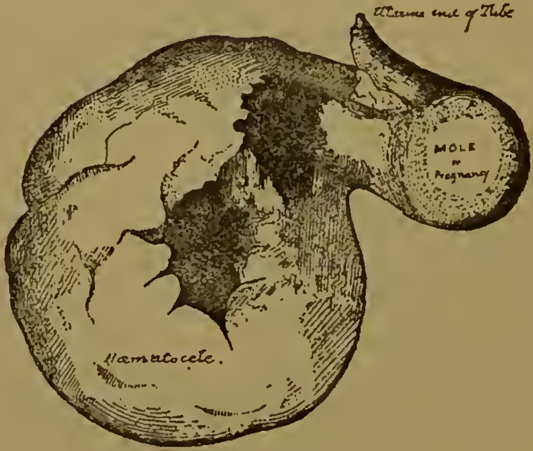

Fig. 16.

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* Prof. Saenger, of Leipzig, appears to have first described this special form of hæmatocele by the name of "solitary hæmatocele." My own observations were made independently (see *Brit. Gyn. Jour.*, 1895, p. 88).

a marked tubo-ovarian tumour, which evidently might have given rise to the (unfounded) suspicion of an ovarian pregnancy.

But it is only rarely that the hæmorrhage ceases on the immediate formation of the hæmatocele. In nearly all cases of tubal pregnancy with hæmatocele the bleeding is recurrent. The source of the bleeding is the tube, and this is necessarily now in the centre of the hæmatocele. The outer covering of the latter is stretched and distended, somewhere it "gives" to the strain, fresh blood and blood clot are forced through the rent, or bulge through the weakened capsule into the abdomen, fresh local peritonitis occurs, fresh adhesions form, the rent is patched up, and the hæmatocele (greatly increased in size) again goes on.

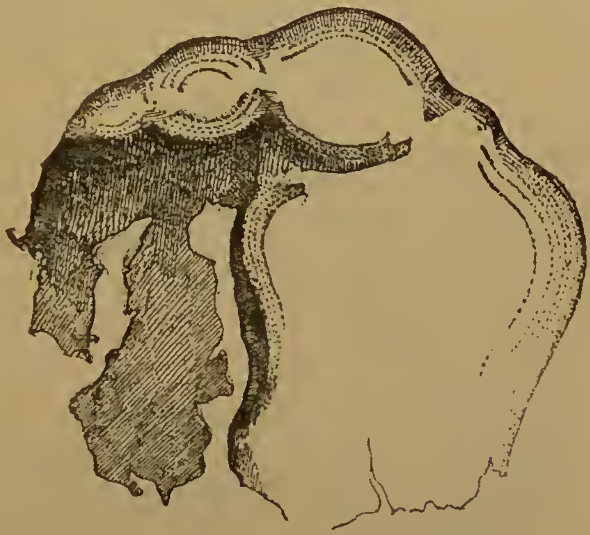

FIG. 17.

In operating on a hæmatocele which has been formed in this way by several recurrent bleedings from the fimbriated end of an unruptured tube, what sort of specimen do we remove? The recent blood and blood clot at the site of the last abdominal bleeding—the weakest part of the hæmatocele—are involuntarily broken down by the hand on touching the tumour, this and the central part or contents of the hæmatocele are washed or scooped away, parts of the outer wall are broken off and left adhering to intestine or omentum, and when the Fallopian tube together with the remainder of the sac is ligatured and removed, we find the outer shell of the hæmatocele forming a curious ragged extension of the tube, and if we view the tattered remnants of the capsule from within we may usually observe some fimbriæ of the tube at one point on the inner wall. This marks the aperture of entrance from the tube into the hæmatocele. The following sketches of specimens removed from cases 14, 12 and 9, show this very plainly. In figure 17 we see a specimen which looks at first sight like a tubal pregnancy which has ruptured into the broad ligament, so extensive are the remnants of the capsule continuous with the tube. On careful section, however, we see (fig. 18) that it is un-

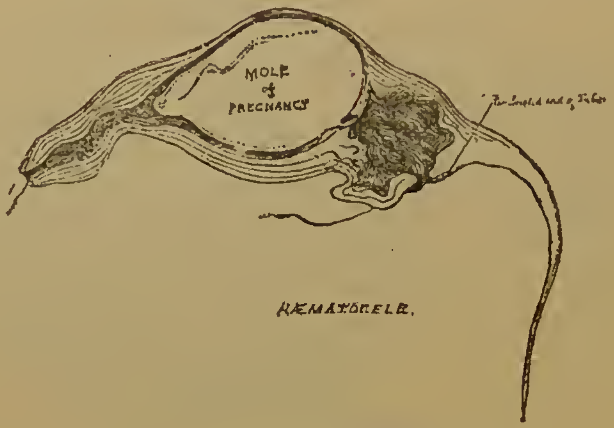

FIG. 18.

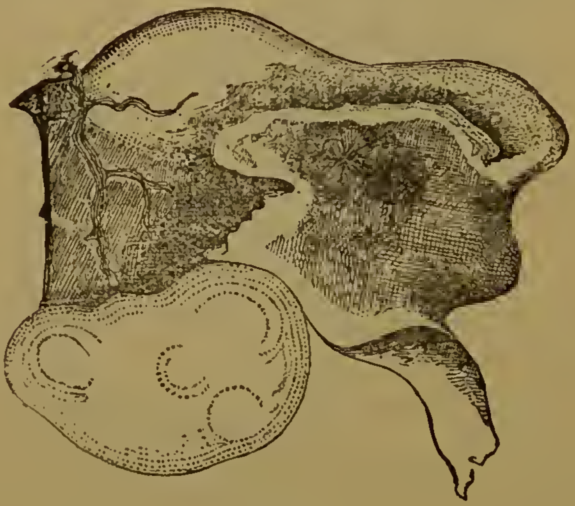

FIG. 19.

ruptured, that a large mole of pregnancy occupies the middle portion of the tube, that the outer end of the tube has been dilated by hæmorrhage, and that the greater part of the tumour has been formed by the capsule of the hæmatocele, on the inner surface of which the fimbriæ of the outer end of the tube abruptly terminate. Similarly in figures 19 and 20, although the remains of the hæmatocele capsule are much less extensive, we may recognise in each the unruptured tube (complete from uterine end to fimbriæ) the mole distending one portion of the tube and the rosette of fimbriæ opening on the inner wall of the hæmatocele capsule.

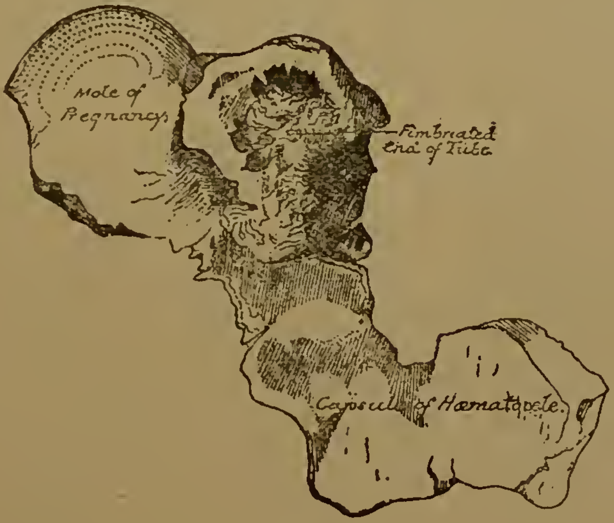

Fig. 20.

The following case, to which the specimen depicted in the last illustration belongs, may be taken as fairly typical of the history associated with such tubal moles and blood-tumours as I have been describing:—

Mrs. D., æt. 39, has been married for 17 years. She has five children, the youngest of whom is 11 years of age. Her last normal menstrual period was on June 3rd, 1892. She has had irregular uterine hæmorrhage since July 10th. There is no clear history of the passage of any definite membrane, but it is quite possible that shreds of membrane have passed with the discharge. She has been perfectly well until quite recently, and even now complains of nothing but the menstrual irregularity and continued loss. This history was taken on her first visit to the Hospital on August 26th. On examination I found that the uterus was retroflexed, and that a small mass having all the characters of a tubal tumour was to be felt behind and to the right of the retroflexed uterus. The diagnosis was made of early extra-uterine pregnancy, but I had no vacant bed, and the patient was allowed to return to her home. On Sept. 2nd she began to suffer severe abdominal pain, and this date probably marks the beginning of intra-peritoneal hæmorrhage. On Sept. 13th she was admitted into hospital having been confined to her bed for several days with recurrent abdominal pain and sickness. On admission she is seen to be decidedly anæmic, her abdomen is generally distended and very tender, she lies in bed with her legs drawn up, her countenance denotes anxiety and suffering; and on examination, instead of the definite tubal tumour originally felt, the whole of the pouch of Douglas is recognised as filled by a mass the upper limit of which it is impossible to define on account of the abdominal distension and tenderness. To the diagnosis of tubal pregnancy the further diagnosis is added of "intra-peritoneal hæmorrhage." On Sept. 15th I operated, removing the specimen which has already been briefly described. There was some dark fluid blood free in the pelvis, the result of a recent rupture of the hæmatocele. The main tumour filling the pouch of Douglas consisted of this hæmatocele which had formed around the fimbriated end of the right Fallopian tube. Within the tube a mole of pregnancy was found. The patient made a good recovery and was discharged on October 8th.

Sometimes the whole of the pouch of Douglas is occupied by the hæmatocele. When this is the case there is, as a rule, no prominent tumour in the abdomen, but an irregular thickening, stretching across the lower part of the belly above the pubes, which marks the upper limit of the blood-effusion. The prominence and distension of the hæmatocele caused either directly by the hæmorrhage or secondarily by inflammatory effusion below its upper limit is entirely expended on the pouch of Douglas. This enlarges in every direction and encroaches on the vagina and rectum, until the typical tumour is formed which is characteristic of full distension of the pouch when its upper connection with the general peritoneal cavity is temporarily occluded. Some writers describe this as the common or usual result of intra-peritoneal bleeding. In my own experience it is quite exceptional. Whenever it does occur the difference of tension between the distended pouch of Douglas and the upper abdomen proclaims the fact that the lowest part of the peritoneum is entirely shut off by adhesions from the rest of the cavity, and because of this (as we shall see) the condition can be treated as a purely local affection.

CHAPTER VI.

LATER RUPTURE OF THE PREGNANT TUBE.

THIS may take place at any time from the first month onward, but is most common from the second to the fourth month. If the pregnancy is situated in the middle or outer portion of the tube and especially if in its growth it opens up to some extent the two layers of the mesosalpinx, the pregnancy may continue to develop for some weeks before rupture or extrusion occurs. When rupture does take place, although the accident may be fatal (and usually is so without operation), the hæmorrhage is probably never so directly and immediately fatal ("fatal without warning") as in the cases of very early rupture when the pregnancy is situated at the uterine end of the tube. It is even possible for hæmorrhage to be altogether absent.

The reason for this variable amount of hæmorrhage is to be mainly sought for in the involvement or escape of the placental attachment. The tube, subject to slowly increasing pressure from within, becomes stretched and thin. As it enlarges and opens up the layers of mesosalpinx, space is gained in which a pregnancy may develop for some weeks without material difficulty. This space is further protected by the bony pelvis on the side where the pregnancy is situated, and on the opposite side the displaced uterus forms a strong support or boundary. But the time comes, and usually about the third month, when this space is altogether insufficient for the growing tumour. Then either the peritoneum must be still further displaced and the pregnancy must burrow downwards into the cellular tissue beneath it (this belongs to tubo-ligamentary pregnancy and will be considered later), or the covering of the pregnancy gets thinner and thinner and the pregnancy moves upwards until in some places there is probably nothing but the one layer of peritoneum between it and the abdominal cavity. Then with further growth not only is rupture inevitable, but some extrusion of the pregnancy into the abdomen—either partial or complete—is a necessary consequence also. For the present this intra-peritoneal extrusion alone will engage our attention. If the placenta be exposed, separated or torn, the bleeding will be severe—if, on the contrary, the placenta is not involved by the rupture any hæmorrhage will come from the separated tube alone, and this may be moderate, infinitesimal or wanting. Even if placental, the bleeding is only rarely directly and immediately fatal. "As the blood pressure falls the hæmorrhage ceases—at all events for a time—and a more or less well-marked attack of local peritonitis immediately follows. This peritonitis is neither so violent and dangerous nor so protective (by the formation of firm adhesions) as is the peritonitis set up by suppurative inflammation, but it is sufficient to form a kind of roof or cap of adhering omentum and intestine which covers and confines the hæmorrhage and blood clot. In this way a distinct but unstable intra-peritoneal hæmatocele is formed. I call it unstable because it is always subject to change. Fresh hæmorrhages occur, sooner or later, owing to the increasing detachment and protrusion of the placenta which so frequently follows the rupture, or the pregnancy may continue to grow. In either case the hæmatocele increases in size, its upper limit becomes convex and tense from the augmented contents, and every few days or every day some fresh strain is placed on the boundary of the hæmatocele. This, which is never marked by any solidity or strength, finally gives way, and a fresh invasion of the general peritoneal cavity takes place. Under these circumstances diffuse hæmorrhage into the peritoneum may occur and be as marked as in the cases of acute bleeding from early rupture, but is more frequently followed by another arrest and further repair. Whether this happens or not, however, it is not now so much the rupture of the tube which is the seat of danger as the separation of the placenta and the rupture of the hæmatocele."

From this description which (in the main) I quote from an article on Intra-peritoneal Hæmatocele written in 1895, it will be evident that the hæmatocele caused by later rupture of the tube, when fully formed, is essentially similar —save in extent and severity—to that I have already described as occasioned by tubal mole. There are, however, some points of difference which almost necessitate the separate consideration I have given to the hæmatocele of tubal mole and to that of later tubal pregnancy with rupture. The hæmorrhage in tubal mole is of quite a different character from that which occurs in later rupture of the tube. In tubal mole it is a more or less continuous blood-drip from the fimbriated end of the tube, varied perhaps by an occasional little gush of freer bleeding at irregular intervals. In later rupture of the tube the hæmorrhage is sudden and relatively copious, arising, as we have seen, either directly from the tear in the tube, or from separation of the placenta, or from both combined. In tubal mole, owing to the slow formation of the blood-tumour the outer layer of blood has time to consolidate, and some measure of true encapsulation, however imperfect, is usually met with. In later rupture of the tube, on the contrary, any "encapsulation is quite exceptional, and the hæmatocele is limited only by the inflammatory adhesion caused by the peritonitis which follows the hæmorrhage. Finally, the whole condition in later rupture of the tube is more acute." The hæmatocele is larger at its onset and rapidly increases in size. It may often be visibly watched enlarging and distending as fresh bleeding takes place beneath the thin limiting adhesions, and it is then accompained by signs and symptoms proportionate to the severity of the condition.

Mrs. E, aged 31, married 11 years, had one child ten years ago, in 1885. From this time she menstruated regularly until Oct. 12th, 1894, this being the date of the last normal period. Irregular hæmorrhage followed and continued from October until Jan. 27th, 1895 (the date of operation). During the latter part of this time she was the subject of increasing abdominal pain mainly referred to the right side, accompanied by distension, vomiting, faintness, and constipation. Some jaundice and albuminuria were also present. The temperature was slightly raised, fluctuating from 99° to 101·3° F. In spite of the general abdominal distension a large mass was to be felt on the right side of the abdomen reaching from the groin to the umbilicus, and having in this situation a convex free border and a more or less globular elevation. The abdomen was very tender to touch. The mass had been felt by the patient and observed by her medical attendant as rapidly increasing in size from a small lump above the groin to its present dimensions during the week or ten days before my visit. On vaginal examination a large firm tumour was felt in the pouch of Douglas behind the uterus, and this appeared to be continuous with the abdominal tumour.

The diagnosis having been made of intra-peritoneal hæmatocele due to a ruptured tubal pregnancy, the abdomen was immediately opened. This contained a little coloured serum, but was free from any diffuse hæmorrhage. The mass on the right side, black in colour, was confined by thin adhesion, and the convex border was formed by small intestine, transverse colon and omentum matted together over the surface of the hæmatocele. An opening was made below this, and the child (a fœtus of some two months' growth) together with the placenta were removed from the centre of the blood and blood clot in which they were lying. The placenta had already become almost entirely detached from the tube by hæmorrhage, and the slightest traction was sufficient to complete the separation. The tubal sac which had contained the placenta and was the seat of an extensive rupture was found to be lightly adherent beneath the blood clot. It was separated from the posterior adhesions, unrolled from the floor of the pelvis, ligatured and removed. The patient made a good recovery.

Mrs. E., aged 38, menstruated regularly from the birth of her last child (twelve years previously) until November, 1887. In December and January she had occasional loss of blood but no regular period, and from November she suffered from gradually increasing pain in the right side. Early in February 1888 she noticed a "lump" in this situation which rapidly enlarged with corresponding increase of pain, and during the latter part of this month she had been unable to sleep on account of pain. She also suffered from dysuria and frequency of micturition. When seen (on March 4th, 1888) a tender, tense, elastic or semi-fluctuant tumour was found on the right side of the abdomen extending from the pelvis to within a short distance of the umbilicus. The uterus was fixed and pushed to the left by the tumour, and the doctor in attendance reported that the tumour was "rapidly enlarging." I opened the abdomen on March 7th. The tumour, black in colour, was formed by a mass of blood and blood clot filling the pelvis and right inguinal region, and closed in or separated from the general peritoneal cavity above by adherent omentum. On loosening this a fœtus of four months' growth was found in the middle of the blood clot, while the placenta was still attached to the interior of the left Fallopian tube in which the pregnancy had started. The tube had become widely opened out at its fimbriated extremity, and this was the only rupture found, but there was some marginal separation of the placenta and this separation was most likely the source of the hæmorrhage. The tube and fœtus were removed in the usual way and the patient made a good recovery.

The specimen removed in this case—the tube, placenta and fœtus—are represented in the accompanying illustration (fig. 21). The placenta has suffered considerable mechanical displacement from the tube since the specimen was first put up. It was originally almost covered by the tube. During the removal of the pregnancy the amniotic sac was torn and only a portion of it can now be seen. Before operation it was in all probability intact and completely covered the fœtus. If I restore this amniotic sac, replacing the outline of it around the fœtus and cord, and if (for purposes of argument or explanation) it be conceded that the bleeding might have ceased and the portion of placenta separated from the tube have recovered good attachment and blood supply, we shall reproduce the exact conditions under which a child may continue to grow within the abdomen of the mother—in other words, the tubal pregnancy may be recognised in this specimen as transitional—the tubal pregnancy is already becoming "abdominal."

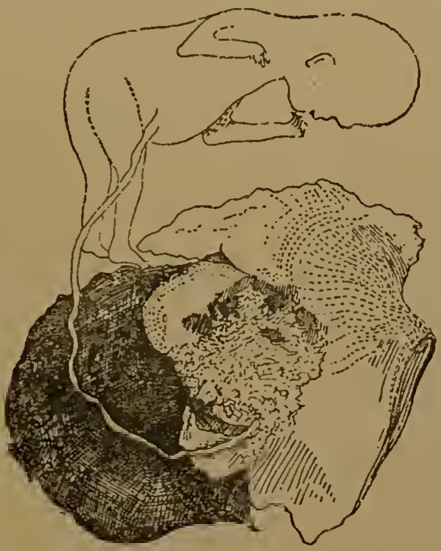

FIG. 21.

Here, then, we come to a clear crisis in the history of extra-uterine pregnancy which deserves special consideration. It is a crisis which is not necessarily fatal either to the patient or the pregnancy, and may therefore have far reaching consequences. Up to this stage the extra-uterine pregnancy has been tubal. Now it is wholly tubal no longer. The placenta, true to the law and power of its attachment, remains mainly or entirely within the tube, but the fœtus has escaped beyond its confines—upward—into the abdomen of the mother. It now lies altogether above the tube and placenta, which remain beneath it, in the pelvis. Directly illustrative, as this specimen is, of the initial steps belonging to only one form of invasion, it may also be taken as a kind of finger-post to mark the "parting of the ways," for the beginnings of the tubo-ligamentary invasion are very similar or parallel to those of the tubo-abdominal form of pregnancy. In both it is the fœtus which escapes from the shelter of the tube, but in the tubo-ligamentary pregnancy the fœtus takes a different direction—downwards—below the tube into the connective tissue beneath the peritoneum. In both the placenta remains attached to the inner surface of the tube.

CHAPTER VII.

THE THREE INVASIONS OF TUBAL PREGNANCY—(1) TUBO-ABDOMINAL, (2) TUBO-LIGAMENTARY, AND (3) TUBO-UTERINE.

TUBO-ABDOMINAL PREGNANCY (*syn.*, ABDOMINAL OR VENTRAL PREGNANCY).

WHEN a fœtus which has been already formed within the Fallopian tube escapes from the tube enclosed in its *unruptured membranes* into the abdomen of the mother, the pregnancy becomes "abdominal" or "ventral." If the placenta retains its attachment to the tube and receives sufficient blood supply from the maternal blood vessels the pregnancy may pursue an uninterrupted course to term and both child and placenta attain mature development within the peritoneal cavity of the mother. The protection of the unruptured amnion, however, appears to be absolutely indispensable for this development. I am aware that in making the statement that a tubal pregnancy thus directly becomes abdominal, I am running counter to the accepted teaching of such authorities as Mr. Lawson Tait and Mr. Bland Sutton. The difficulty in believing this lay in the fact that in most of the recorded cases the child has been described as lying naked and uncovered within the peritoneal cavity of the mother. Our leading authorities have argued, and probably argued rightly, that no fœtus at any early age could be so exposed to the peritoneal cavity and its secretion and yet survive. They have accordingly sought for some method of explaining how the facts established by observation—the intra-abdominal position of the child—could possibly arise. The theory advanced is that every extra-uterine pregnancy which has survived the primary rupture of the tube and has continued its development has done so beneath the peritoneum, sheltered within the folds of the broad ligament (*see* Broad Ligament Pregnancy), that here it has remained till the seventh or eighth month, and then a secondary rupture of the broad ligament cyst has taken place, and the child has escaped among the intestines, "its tissues having arrived at a period of development by that time, which enabled them to resist the efforts of digestion which doubtless would be directed towards them."*

Although those of us who had operated on cases of abdominal pregnancy at full term felt that this theory was far fetched and mistaken, for no broad ligament pouch from which the infant had escaped could then be found, and although the theory was more or less disproved by isolated cases of abdominal pregnancy reported by Dr. Jessop, by Dr. Champneys, by myself, by Dr. Webster, by Dr. Cullingworth, by Dr. Aust Lawrence, and even by Mr. Tait himself, I do not think we could be said to have any good explanation of the mystery to offer until a case on which I operated at the Spark Hill Hospital for Women on Dec. 11th, 1896, brought further light and explained how the child could inhabit the peritoneal cavity of the mother and still survive. On careful examination of the abdominal cavity in this case conducted by myself and my colleagues, Mr. Martin and Mr. Jordan, it was found that a transparent membrane (the amniotic sac) surrounded the fœtus and protected it in every direction, and that this was invisible on the surface of the intestine, but could be demonstrated as a film passing from coil to coil and completing the sac in which the pregnancy had developed. The case was reported by me to the Obstetrical Society of London in 1897, and the following account is copied from the Transactions of the Society :—

Mrs. G., aged 27, was sent to me by Dr. Clarkson on November 30th, 1896.

She gave the following history :—She was married nine years ago, and is the mother of four children, the youngest of whom is now four years old. After this child was weaned she menstruated regularly until one year ago, when (as she believed) she became pregnant, and the "periods" ceased for ten months. She felt exactly as in former pregnancies, but the movements of the child were unusually distinct and painful and observed over a wider area, being felt "high up under her ribs" as well as "low down near the groins."

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* Tait, "Lectures on Ectopic Pregnancy," p. 59.

She engaged Dr. Clarkson to attend her in her confinement some four or five months ago.

From the beginning of the pregnancy the patient was troubled with nausea and vomiting, and on three or four occasions (after about twelve weeks' amenorrhœa) the vomiting was accompanied by slight hæmatemesis. For this reason, and for no acute pain or illness, the patient remained in bed for one week at this period, and was attended by her doctor for "ulceration of the stomach."

At no period during the whole course of the pregnancy was there any acute pain, sudden illness, or fainting. Beyond the general malaise, the vomiting, a dull pain in the upper part of the abdomen, when this was at its worst, and, later on, the exceptionally painful movements already described, there was nothing to specially mark the course of pregnancy until the time of expected labour. About fourteen weeks ago the movements of the child, which had already caused her unusual pain, became still more violent, and the patient was obliged to go to bed for a fortnight. At one time she supposed herself to be in labour, and sent for Dr. Clarkson, who told her that she was mistaken, but advised, if the pain continued, that she should be taken to the Women's Hospital. At the end of this fortnight, after taking some medicine, the pain rather suddenly ceased, and since this date no movements have been felt.

From this time until the patient's admission (twelve weeks) her general health has improved, she has been able to do her housework, and, with the exception of the (continued) enlargement of the abdomen, she has had but little to complain of.

No discharge occurred until seven weeks ago, when some hæmorrhage from the vagina was first noticed. This has continued more or less ever since. Five weeks ago it became excessive, and the "flooding" lasted for two or three days. At this time two pieces of "flesh" came away, which were said to be pieces of an after-birth.

On examination the patient is seen to be dark and very thin, but of good facial aspect and general appearance. The tongue is clean. Pulse 60, regular. Heart and lung sounds normal. The abdomen is considerably enlarged and contains an irregular tumour, which is easily palpated, and may be roughly divided into three parts. It appears to consist of (1) a globular mass immediately above the symphysis pubis, the centre of which is to the right of the middle line; (2) an elongated portion which occupies the middle and left side of the abdomen, extending to beneath the ribs on this side; and (3) a second globular mass, high up on the right side of the abdomen, apparently fixed in this situation, and inseparable (by percussion) from the liver dulness immediately above it.

In the middle part of the tumour (2), which appears to correspond with the trunk and limbs of a fœtus at full term, one fœtal extremity may be felt beneath the abdominal parietes, but whether this is an arm or leg it is difficult to determine. The result of auscultation of the abdomen (carried out for me by my colleague Mr. Martin) is negative.

On vaginal examination the true pelvis is found to be free from any tumour;

the uterus, which is rather displaced to the left side, is of normal size, and apparently empty of any contents.

The *diagnosis* was made of extra-uterine pregnancy which had progressed to term and was now retained, the fœtus being dead. It was supposed that the head of the fœtus was lying just above the pelvic brim and slightly to the right, that the trunk of the child was occupying the left side of the abdomen, and, if so, that the mass beneath the liver must be the placenta. It was also considered as most probable that the child was lying free in the abdominal cavity.

"*Operation.*—On Dec. 11th, 1896, assisted by my colleagues, Mr. Martin, Mr. Jordan, and Dr. Sturge, I opened the abdomen in the middle line and found that the peritoneum immediately below the incision was thickened and incorporated with some kind of sac containing a dead but non-putrid fœtus. On opening this the child was found lying in the abdomen bathed in a small quantity of dark bloody fluid. In this some caseous particles were floating. The head of the child lay uppermost and formed the globular protuberance which had been noticed near the liver. The intestines were visibly covering the body of the child, and the great omentum, forming in one part a thick fleshy body of considerable thickness, passed across the child to a broad attachment on the upper part of the placenta. The latter was situated at the lower pole of the pregnancy and covered the pelvis. The parts of the child nearest to the incision were the lower limbs, and after pulling the feet outside and enlarging the incision to admit of the passage of shoulders and head the child was extracted. The cord was then divided and the child removed. On looking into the abdomen the peritoneal cavity appeared to be directly open as in an ordinary abdominal section. The coils of intestine, the lower part of the stomach, and the great omentum were all plainly visible, and separate loops of intestine could be brought out of the incision and examined. On very close observation it was first noticed by Mr. Martin and afterwards confirmed by myself and Mr. Jordan, that a very thin transparent pellicle or membrane was reflected over all, or nearly all of these viscera, and that notwithstanding the apparent free exposure of the peritoneal cavity there was in all probability a thin, filmy, transparent sac enclosing the pregnancy, not capable of separation or differentiation from the peritoneum of any viscus over which it was reflected except where passing from one to another, as from one coil of intestine to another or from intestine to placenta. Only under these circumstances was the membrane visible.

"*Removal of the placenta.*—The placenta was of ordinary size and covered the pelvic inlet 'like the lid of a saucepan' incompletely closed, the edge of the placenta being exposed and free on the left side of the pelvis, but closely applied to the abdominal wall on the right side where the cord was situated. The attachments of the placenta were:—(1) a thick band or rope of omentum which was firmly attached to the upper or serous edge of the placenta on the left side; (2) several thin attachments or adhesions of small intestine and cæcum to the same surface; these appeared to be possible of explanation as reflections of the thin sac layer (amnion) from the intestine to the placenta; and (3) the deep pelvic attachments of the under surface of the placenta, which at this stage were hidden from view by the placenta itself. The band of omentum was ligatured in sections and divided; then the adhesions to the bowel were separately tied and cut through. By tilting up the free (left) edge of the placenta it was now possible to discover a broad band of attachment below it in the pelvis. This was seized by a pair of Doyen's elastic forceps and divided. When this had been done a further part became accessible and it was found possible by gentle manipulation to secure either by forceps or ligature all pelvic attachments before separation, so that the placenta was finally removed without any loss of blood, and therefore with a clear field for deliberate operative work throughout. Below the placenta, in the pelvic portion of the sac, was found quite a collection of caseous masses (remains of the vernix caseosa), which was cleared out of the pelvis partly by the fingers and partly by a douche of warm water which was used for washing out the abdomen. The main attachments, which had been temporarily clamped by forceps, were found to come from the right broad ligament. These were ligatured in sections beneath the forceps and the forceps were then removed.

"On examination of the pelvis where the placenta had been it was evident that the same arrangement of sac existed here as in the upper abdomen—that is, a fine transparent membrane could be traced throughout and formed a limiting layer between the usual viscera of the abdomen, pelvis, and placenta, on the one hand, and the child on the other. On replacing the placenta in position this membrane could be traced below the placenta to the bottom of the pelvis on the right side ; it was then reflected over the broad ligament and all its attachments to the under surface of the placenta. From this it could be traced all over the placenta except where intestine or omentum was adherent to its surface. Two-thirds (at least) of the placental margin was free, and this was consequently smooth, glistening, and everywhere covered by the thin membrane of the sac. Owing to this disposition of the sac within the pelvis the outline of the normal pelvic viscera, the uterus, tubes, and ovaries were considerably obscured, so much so that it was impossible to say whether the right ovary had been removed with the placenta or whether it had been left in the pelvis below the reflections of the sac.

"The abdomen was closed with silkworm-gut sutures and a drainage tube left in the lower angle of the wound. The after progress of the case was satisfactory and uneventful except for some chronic suppuration in the lower part of the wound. This appeared to be kept up by caseous remains which had been imperfectly removed, as on more than one occasion some caseous particles were observed in the discharges. The patient was discharged convalescent on Jan. 25th, 1897.

"*Description of parts removed.*—The child weighs 7 lb. and is a male fœtus which has undergone full development within the abdomen of the mother. The nails of the fingers extend some distance beyond the finger-tips and are firm and horny. The testes appear to be within the scrotum and the hair of the head is abundant, but short. The trunk and limbs are perfectly developed; the head is rather large in proportion to the rest of the body and is bent or twisted to the right, so that the left (or extended) side of the neck and face appears to be permanently larger than the right, the head being fixed laterally towards the right shoulder. There are no signs of decomposition. Closely applied to the head of the child is a perfect cap of membrane and between this and the head of the child is a considerable quantity of caseous matter. This is the only part where any membranous covering or sac can be distinguished. The umbilical cord and its fœtal attachment are in every respect normal. The placenta weighs 3 lb.; it is thick and fleshy and of fairly normal consistence. On its upper surface and edge it is marked by (1) the insertion of the cord excentrically placed; (2) by the attachment of a divided thick band of tissue, probably omental; and (3) by several large distended vessels almost unsupported by any tissue, but directly attached to the placental surface or edge. (These appear to be portions of adherent omentum which have been changed into congeries of dilated veins). The shape of the placenta is peculiar; the bulk of it is circular, with an excentric cord inserted near one border (the right). Beyond this and separated from it by a deep sulcus is a crescentic mass of placental tissue attached to the main placenta by its horns and lower surface. On the surface of this crescentic part is a pale red fringed mucous patch, which appears to be the fimbriated end of a Fallopian tube. No further trace of tubal structure can be made out on macroscopic examination and on section of the mass it appears to consist throughout of placental tissue. The under surface of the placenta is in many parts as smooth and free as its upper surface, but it is marked by a long strip of raw surface running across the placenta, with a bend or angle in its course. This marks the attachments of the placenta to the right broad ligament.

"*Remarks.*—The pregnancy may be regarded as originally one of the right Fallopian tube, which, by gradual erosion or giving way of the upper part of the tube, has passed with unruptured membranes into the abdominal cavity. The deep sulcus on the upper surface of the placenta probably marks the line of separation in the tube where the ovum escaped upwards into the abdomen. From the spread out internal surface of the (ruptured) tube the placenta has continued growing and has so altered or taken up its structure in process of growth as to render little but the fimbriated end recognisable. The placenta has derived its blood supply from the vessels of the broad ligament and from the great omentum.

"The case is remarkable for possessing no history of any tubal rupture (or acute illness corresponding to this) throughout the whole course of the pregnancy. The conditions and opportunities for observation during the time of operation were unusually good, but in spite of this the exact state of the upper pole of the pregnancy and its relation to the abdominal viscera must be determined by circumstantial evidence as it could not be directly seen from the incision. From the fact that the head of the child is closely covered by a cap of membrane, between which and the scalp is a copious deposit of caseous material, while below this any evidence of a membranous sac is wanting (except the tear of separation around the forehead and occiput), it may be concluded, I think, that the upper part of the amniotic sac—the membrane forming the extreme upper pole of the pregnancy—has been removed with the fœtus; and that, so far as this is concerned, the abdominal cavity has been directly opened. Below this, towards the centre of the pregnancy, the sac has become incorporated with the peritoneum so that no separation could be made between the two and no indication of the presence of a sac could be seen except at its reflection from one viscus to another as already described. At a lower level still—at the 'lower pole' of the pregnancy—the sac was considerably thickened, forming, together with the peritoneum at the lower part of the abdominal incision, a membranous wall fully one-eighth of an inch in thickness. Even here, however, no definite dissection could be made between 'sac' on the one hand and 'peritoneum' on the other."

The importance of the case just quoted in the present state of our knowledge cannot be over estimated. It effectually disposes of much of the theory now current on the subject of advanced extra-uterine gestation. On page 464 of Allbutt and Playfair's *System of Gynæcology* (1896) Mr. Bland Sutton writes:—"Observation has demonstrated the fact that in all tubal pregnancies which survive the primary rupture and continue their development the gestation sac is formed in part by the expanded tube, but mainly by the layers of the mesometrium. The proper appreciation of this fact has done much to simplify our knowledge of tubal pregnancy, and no one has more strongly insisted upon its correctness than Lawson Tait." That this is altogether mistaken is now, I believe, a certainty. The case of abdominal pregnancy here described is a tubal pregnancy which has survived the primary rupture and continued its development, in which the gestation sac is formed by the amnion alone or at most by the fœtal membranes and tube, the layers of the mesometrium are intact, and the expanded tube is entirely taken up and metamorphosed by the growth of the placenta.

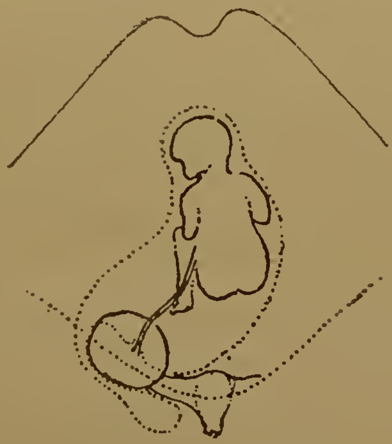

FIG. 22.

A diagrammatic representation of the pregnancy (fig. 22) in which the omental attachments are omitted as non-essential, may help to make this important variety of extra-uterine pregnancy clearer and to elucidate the relations of its sac. The essentials of the pregnancy are the fixed placenta growing mainly or entirely from the tube to which it was originally attached and the child enclosed simply in its amniotic sac, moving so far as the delicate sac permits it within the abdomen of the mother. The amniotic sac may be in some places separable from both mother and child, in other parts it may be quite inseparable from the peritoneal covering of the abdominal viscera within the maternal abdomen. The condition is produced in the most simple manner. The pregnancy begins within the tube and grows there until it can grow no longer. Then by rupture or by some slow separation of the tube equivalent to rupture the tube is opened up. The child within its amniotic sac escapes upwards into the abdomen, the placenta remains attached to the inner surface of the tube, and from this, spread out and flattened by the rupture, the placenta continues to grow.

But this case not only tends to disprove the broad ligament theory as of universal or even general application. It serves another and more important purpose. If the cases of abdominal pregnancy be carefully considered in the light of the explanation here offered it will be found that most, indeed very nearly all, of the recorded cases in which no definite sac has been found admit of a similar interpretation. In Mr. Jessop's case it is stated that "the peritoneal lining, though natural on its free surface, appeared thick and velvety in section," and later we read: "A few bands of unorganised lymph of a very friable nature lying upon, but not adherent to, the intestines were readily removed by sponging and about an ounce of a clear serum was found in the peritoneal cavity." The definite amount of serum here mentioned is decidedly suggestive of some unrecognized limiting sac and not of free fluid welling up from the pouch of Douglas out of sight. In Bandl's case, quoted by Mr. Tait, the fœtus was enclosed in a "pocket formed by false membranes." In Dr. Champney's case the references to some filmy kind of sac are still more obvious. We read: "The layer immediately covering the fœtus was a dull white membrane." Again: "On the child's vertex a patch of thin, sodden-looking membrane was seen, and except a shred of similar material removed from the wound (probably torn from the head during delivery) no membranes were seen or felt." In the report of the dissection of the child we read: "There was a sort of cap of sodden membrane (amnion) on the vertex which was covered with dark hairs," and in the report of the necropsy of the mother: "The fœtal surface [of the placenta] was also marked by a remnant of membranes which hardly extended beyond the placenta." The similarity between this case and those which I have myself reported is, I think, clear and unmistakable.

The lower pole of the pregnancy does not always take the form described in the case I have just reported and depicted in the illustration. In a case on which I operated at term, both mother and child surviving, the amnotic sac stopped short at the placental insertion as in normal intra-uterine pregnancy, and the raw under surface of the placenta had extended or grown beyond its tubal site and was attached to the posterior surface of the uterus, the sigmoid flexure and the pelvic wall as well as to the tube. But though I failed to fully understand it at the time I am now quite satisfied that the pathological relations of the fœtus were exactly similar to those I have described as present in the preceding case. The ragged margin of the amnion in this case may still be seen attached to the placenta, and the rest of the sac was probably continued as a transparent covering or sheath over the small intestines and the under surface of the great omentum around the space from which I removed the child. The conditions met with in this case are diagrammatically represented in figure 23. The salient features which separate it from the preceding case will be recognised at once on comparing the accompanying diagrams.

There are two other conditions under which the placenta may be found in advanced abdominal pregnancy. In the first the tube, although excessively expanded, may retain its individuality and the placenta be found still lying within it. In one case of this kind, the case of Dr. Halliday Croom, minutely examined and described by Clarence Webster, he states: "A large, well-formed, recently dead fœtus was removed from a sac which extended nearly up to the liver and which had in the lower part of the abdomen a thick anterior wall. There was an excessive amount of amniotic fluid. The uterus was enlarged, elevated, and drawn towards the right side. The placenta was in a separate sac to the left side of the pelvis—a thick discoid mass extending two inches above the brim. The gestation sac was double, one containing the fœtus, the other the placenta. The former was that part of the peritoneal cavity behind the stomach, transverse colon, and great omentum; the latter consisted of the enormously dilated Fallopian tube lying in front of the uterus and extending vertically from the utero-vesical pouch to the fourth lumbar vertebra. Though quite distinct from one another they were connected by means of the umbilical cord and amnion; this membrane lined the secondary (peritoneal) sac and passed into the substance of the primary (tubal) sac."

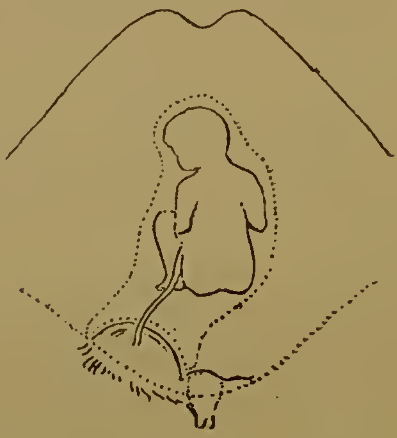

FIG. 23.

Another case very similar to this was reported by Mr. Tait to the Obstetrical Society in 1892 under the title of "A

Case of Ectopic Pregnancy in which the Fœtus seems to have been Developed to the Full Time in the Peritoneal Cavity, still retaining its Amniotic Covering." In the report of this case we read: "The child was lying loose in the abdominal cavity except that all its upper surface had become adherent to the omentum and to the anterior parietal peritoneum. The child was still enclosed in its membranes, but the liquor amnii had entirely disappeared. The umbilical cord went straight down to a round, smooth, globular mass about the size of a cocoanut, which occupied the pelvic cavity and was adherent to the surrounding tissues. The question of the removal of the placenta, which this substance really was, occupied my mind for a few seconds.

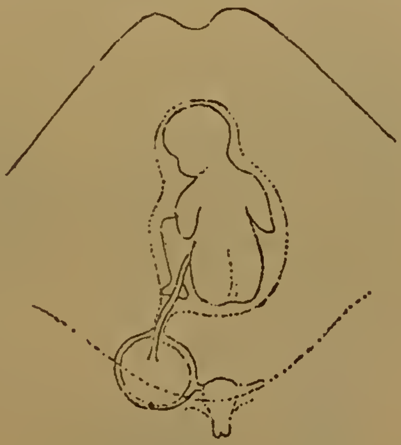

FIG. 24.

On making tentative efforts to separate the globular mass I found that it peeled out with considerable ease, much as a broad ligament cyst would, and after it was separated down to a pedicle which was the cornu of the uterus, it became perfectly evident that the globular mass was the right Fallopian tube." Following the graphic method previously employed to illustrate the relations of the placenta this form may be diagrammatically represented as in the accompanying illustration (fig. 24).

Finally, there is one specimen which shows that the abdominal position of the fœtus may be associated with an intra-ligamentary placenta. For a long time I failed to find any certain evidence that advanced abdominal pregnancy was ever the outcome or sequel of secondary rupture from the broad ligament into the abdomen. But in examining the various specimens to be met with in London I came across a most valuable one in the St. Thomas's Hospital Museum (No. 2491) which shows that this is a possible, though I believe, a very rare occurrence. The accompanying illustration (fig. 25) is a drawing of my own, made directly from the specimen itself. There is a large sac formed by the left broad ligament on one side of the uterus —the uterus, indeed, forms a kind of appendage to its wall —the left Fallopian tube courses over its summit and directly underneath this lies the attachment of the placenta.

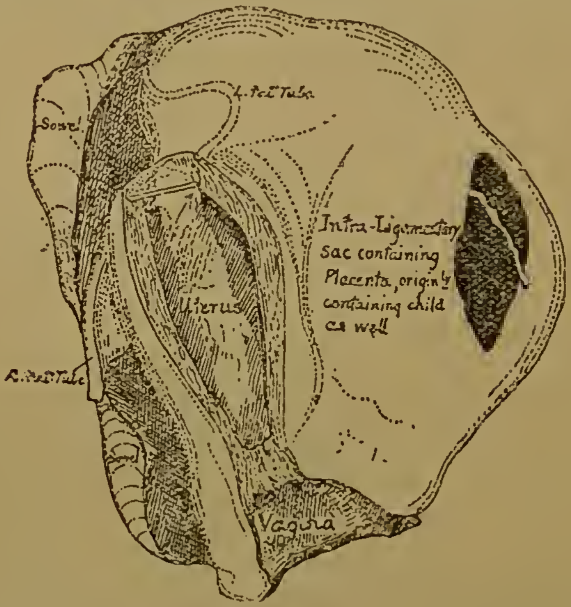
L. Fal. Tube
Sound
Intra-Ligamentary sac containing Placenta, orig'ly containing child as well
Uterus
R. Fal. Tube
Vagina

Fig. 25.

On the outer side of the sac is a rather large lacerated opening through which the fœtus passed into the abdominal cavity. The specimen is said to be taken from a woman who died at the full period of gestation. Although the sac is a large one it is scarcely of sufficient size to have contained a full-time fœtus, and therefore it is at all events highly probable that in the later months of pregnancy the fœtus surrounded by its amnion was strictly abdominal in position as in the other cases I have been describing. If so, we have a fourth position of the placenta in abdominal pregnancy. Strictly speaking this is "tubo-ligamentary-abdominal," and perhaps should be more correctly described under the next division of my subject, but it is more convenient to take its consideration here. Incidentally, it is worthy of notice what a very marked and unmistakable ligamentary sac is to be found when the fœtus has really become abdominal, after passing through an intra-ligamentary stage in its development.

The accompanying illustration (fig. 26), the last of the present series, will bring the preceding case in line with the others I have mentioned.

There are accordingly four different relations of the placenta to the main gestation sac in abdominal pregnancy which need some differentiation. In the first group of cases the placenta is practically within the main gestation sac and covered by reflexions of the amnion. In the second it has a fœtal and maternal surface of nearly equal dimensions as in normal pregnancy, the fœtal surface being covered by the amnion and in immediate relation to the sac, while the maternal surface is growing from the spread out remnants of the tube and from the peri-tubal tissues also, the back of the uterus, the broad ligament and the pelvic wall being favourite sites for such extensions of attachment. In the third, the placenta remains within the tube, the tube is still recognisable and the maternal attachments are confined to the tube itself. In this case there may be a double gestation sac, the one containing the fœtus, the other the

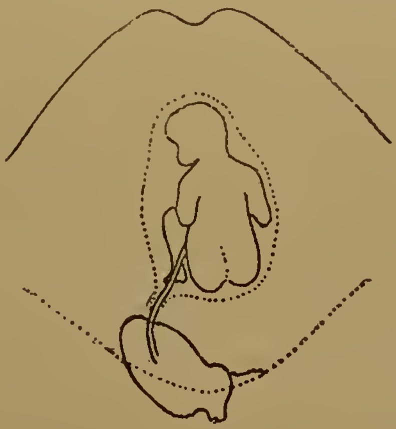

FIG. 26.

placenta. In the fourth the placenta is attached to the upper wall of a broad ligament sac outside the peritoneum, and the cord passes to the child through a hole in the ligament.

Before I leave this portion of my subject I want to finally enforce the point that these illustrations showing the different positions of the placenta in tubo-abdominal pregnancy are no mere imaginative figures showing simply possible relations of the pregnancy to surrounding structures. They are records of facts carefully observed, and are each and all supported by extant specimens still available more or less for individual inspection and verification.

The sac in abdominal pregnancy evidently varies greatly in appearance and consistency. In many of the recorded cases it can hardly have consisted of anything more than the amniotic membrane. This has become attached to the peritoneum, "its epithelial lining becoming destroyed and its sub-epithelial layer (in some places) becoming dense and fibrous" (Webster). In other situations the sub-epithelial layer has been unaffected and the membrane is directly attached to the intestine or the abdominal viscera, is indistinguishable by sight from the proper peritoneal surface of such viscera, and only visible when reflected from one viscus to another as already described. The membranes are not, however, necessarily adherent in this way; sometimes they have a completely independent existence and probably all degrees are possible of partial peritoneal attachment. Sometimes their consistency and independence are such that they have been described as being extirpated (Tait) or sutured (Rosenmauer) at the operation for removal of the pregnancy. Cases so described are, however, sometimes open to the suspicion that an unrecognised broad ligament pregnancy has been mistaken for abdominal. In true tubo-abdominal pregnancy the sac, consisting at the best of amnion and chorion, and often perhaps of an amniotic layer only, must, if independent, always be extremely thin and easily broken. If completely independent it may admit of removal with the child, but it is extremely doubtful if it could ever possess sufficient independence and consistency to admit of any independent suture. The relations of the placenta to the sac are of chief importance and will need some reconsideration under the heading of Treatment.

The extra-uterine placenta at term is an object of considerable interest. Throughout the whole course of the pregnancy the placenta has marked the site of the original and main attachment of the pregnancy, and in its attachment has held, and still holds throughout, the key to much of its pathology and treatment. When the infant has arrived at term the placenta has also reached its fullest development, and, so far as my experience goes, the extra-uterine placenta at term, though often deformed in shape, keeps close to the normal standard both in size and weight. The method by which it has attained this development outside of the uterus may well demand our attention. Mr. Sutton states:—"The fully developed uterine placenta is composed of parts derived from the maternal and fœtal tissues in nearly equal parts; a tubal placenta is mainly if not entirely derived from the fœtal tissues." It is true that there is no clear evidence of a tubal decidua, but the placenta as it increases in size (like a new growth in its progress) absorbs, takes up, and metamorphoses into its own tissue that of the Fallopian tube in which it was originally enclosed, and possibly the ovary of the same side also. In a considerable number of cases it is reported that neither ovary nor tube could be identified on the side of the pregnancy. So completely is this done that all traces of the tube may be lost at term or only the fimbriated end be found, as in the case I have described. When by the reflexion of the amnion this invasion of the placenta is limited to the tube and broad ligament only, the matter is solely one of pathological importance; when there is no such limitation the consequences may be serious.

It will doubtless be noticed that what I have said regarding the pathology and operative history of tubo-abdominal pregnancy appears to explain and confirm in some degree the observations of many of the older writers, and I am pleased to be able in any way to re-establish their credit and re-affirm in the main the correctness of their records. It is true that they considered that the peritoneum itself might discharge the functions of the fœtal membranes (Parry, p. 135) and that the impregnated ovum might from the outset implant itself on the peritoneum, and in both of these guesses after truth they were mistaken. It is true also that in the abdominal or "ventral" pregnancy they thought they saw the child floating freely among the intestines within the peritoneal cavity, and did not dream of the almost invisible sheath of the adhering amnion which formed a sac to the pregnancy; but in their observation of the fact that there was an extra-uterine pregnancy in which the child was abdominal or ventral in position, and in their opinion that this form of pregnancy deserved to be considered as a distinct and special variety of extra-uterine gestation they were perfectly justified, and modern research tends only to confirm their view.*

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* *Note on Utero-abdominal Pregnancy.*—"Abdominal" pregnancy may be the consequence of invasion from the uterus as well as from the tube. An intra-uterine (normal) pregnancy, after rupture of the uterus, may extrude itself through the uterine rupture, and the fœtus, enclosed in its amnion, become "abdominal" or "ventral" exactly as in tubo-abdominal pregnancy. In this case the placenta remains within the uterus, so that if this form of pregnancy be included in our consideration there is still yet another (fifth) position of the placenta that may be encountered in advanced abdominal gestation. Dr. Parry refers to three cases of this class—the case of Patuna (Helen Zopp), the case of Hey (1769), and that of Hofmeister (1829).

The best recorded case is a recent one of Prof. Leopold's, and is published in the *Archiv fur Geb. und Gyn.*, B. lii., p. 376. The following abstract is taken from the Epitome of Current Medical Literature in the *British Medical Journal* for June 5th, 1897:—

"ABDOMINAL GESTATION COMPLETED TO TERM AFTER RUPTURE OF THE UTERUS.

"Leopold (*Arch. f. Geb. u. Gyn.*, lii., p. 376) relates that a woman aged 42, ruptured her uterus in her twelfth pregnancy two or three weeks before quickening by falling down some cellar stairs and alighting heavily on her sacrum and nates. She had no hæmorrhage or abdominal inflammation, and soon recovered; but from the time the child's movements began they caused such severe abdominal pain as to keep her almost completely bed-ridden. About three weeks before the end of her term the movements ceased, she suffered from feelings of coldness and heat, headache, and great discomfort; there was no discharge of blood or decidua. On admission the case was diagnosed as a left-sided extra-uterine pregnancy, with a mature fœtus dead about three weeks. On laparotomy the child was found in a delicate sac, and when it was extracted by the head, the pelvis and feet, which lay near the pancreas, were followed by a coil of small intestine, with which they must have been in direct contact. The cord passed into the uterus through a perpendicular slit, about 2 cm. long, behind the right broad ligament. The uterus was removed with the placenta, the stump secured in the abdominal wound, and gauze drains placed in the fœtal cavity and pelvis. She left the hospital on the forty-fourth day in excellent condition. Leopold gives microscopical and macroscopical details (two plates), and concludes that the uterine tissue had suffered from the numerous pregnancies and labours, in the last three of which the placenta had had to be removed by hand; that the rupture was caused by the posterior surface coming into violent contact with the promontory of the sacrum, and could not have occurred before the seventeenth week, as the reflexa was everywhere in contact with the uterine wall ; that as the placenta remained *in situ* there could have been no sudden escape of the waters, the membranes could not have given way at first, but must have protruded through the gap in the uterus, and been followed by the child's feet and a great portion of the cord ; and that the extrusion of the child must have been gradual. The child, a boy 50 cm. in length, and weighing 2,720 g., was covered with vernix caseosa, and somewhat macerated ; the total length of the cord (49 cm.) corresponded to maturity. The posterior wall of the uterus, very much thinned, showing a cicatrix 6 cm. across and 2 mm. thick, in the centre of which was the opening. A sound passed freely into the uterus all round the cord except at the lower side, where there were some fine adhesions ; there was a supplementary placenta."

The diagram used to illustrate the intra-ligamentary position of the placenta (" tubo-ligamentary-abdominal ") may also be taken as representing a utero-abdominal pregnancy, the uterus being enlarged and retaining its placenta.

CHAPTER VIII.

TUBO-LIGAMENTARY PREGNANCY (*syn.*, BROAD LIGAMENT PREGNANCY.)

A GROWING pregnancy situated in the middle of the Fallopian tube as it expands the tube, instead of thinning and bursting the upper part of the tube, may separate the layers of the mesosalpinx. The space between these layers, which in the normal state is non-existent or represented by the merest line, becomes under these conditions a space of considerable extent. An increasing amount of the circumference of the tube is accordingly separated from its peritoneal covering and exposed to loose connective tissue only. As the tube expands still further it is only reasonable that it should occasionally give way in this direction and that the fœtus should be extruded into the connective tissue space below the peritoneum. This is, indeed, exactly what happens in " broad ligament pregnancy." The rupture of the tube and extrusion of the pregnancy into the broad ligament may be accompanied by considerable hæmorrhage, which still further distends the space beneath the peritoneum and between its layers. An extra-peritoneal hæmatocele or broad ligament hæmatoma is the result, and in some cases the pressure and disturbance caused by this is sufficient to stop the progress of the misplaced pregnancy. When this is the case the hæmorrhage is slowly absorbed and if the pregnancy be early and abortive it undergoes absorption also.

Broad ligament hæmatoma is of rather frequent occurrence as a sequel to any operation involving ligature of the broad ligament,* and the hæmatoma is apt to occur at the first menstrual period subsequently to the operation.

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* More especially when the ligature has been passed with a *sharp* needle: when a blunt needle is used it is very rare for a hæmatoma to follow.

Every surgeon who practises operative gynæcology must accordingly be well acquainted with its leading features. It arises suddenly as a tumour or infiltration on one side of the uterus, it roofs the lateral vaginal fornix with a boggy or hard immovable cement of blood clot, and gradually extends upwards towards the groin of the affected side at Poupart's ligament. Sometimes its prolongations below are ill-defined and difficult to trace, at other times the tumour is defined and its border is abrupt. When the hæmorrhage is extensive and on the left side it may encircle and block the rectum, as Mr. Tait has shown. At other times, by burrowing in front of the rectum low down in the pouch of Douglas (as shown in the accompanying illustration taken from the work of Dr. Hart and Mr. Carter), it may produce a well-defined tumour behind the uterus that closely simulates the intra-peritoneal swelling of a distended and adherent tube (fig. 27). It always causes considerable pain (pain preventing sleep) and is frequently accompanied by transient fever. Broad ligament hæmatoma is often confounded with cellulitis and the differential diagnosis is sometimes very difficult. The bare physical signs in both conditions may be identical. Besides being a rather frequent operation sequel, hæmatoma of the broad ligament is occasionally met with after labour and abortion, and in connection with menstrual irregularity and arrest when no pregnancy exists. Other cases are due to the intra-ligamentary rupture of a tubal pregnancy, as already explained, but these are by no means so frequent as some writers would lead us to suppose. In this respect extra-peritoneal hæmatocele (broad ligament hæmatoma) may be said to contrast with intra-peritoneal hæmatocele. Intra-peritoneal hæmatocele in women is almost always due to tubal pregnancy; hæmatoma of the broad ligament, on the other hand, is only in the minority of cases due to this condition. When the pregnant tube ruptures into the broad ligament the hæmorrhage may be limited or small in amount and the placental attachment may be undisturbed. If so, the tube retains its relation and attachment to the placenta while the fœtus (instead of escaping upwards as in abdominal pregnancy) escapes downwards between the layers of the broad ligament and undergoes its further development beneath the peritoneum.

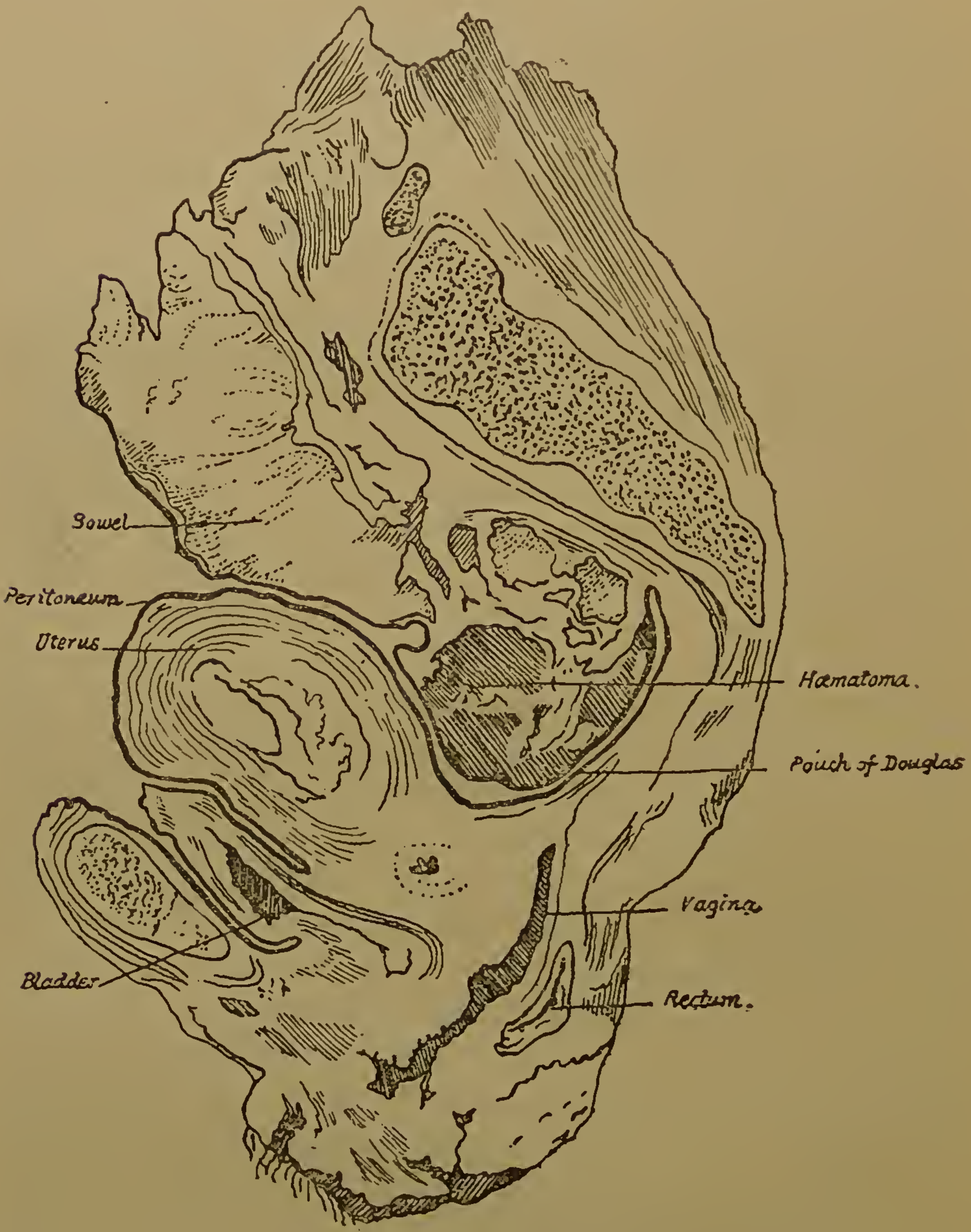

FIG. 27.

Let us take an actual example of this accident and study it more closely. There is a remarkable specimen in Mason College Museum, given by Mr. Hancox, which beautifully shows the condition of a broad ligament pregnancy of four months' growth, and is well adapted for our purpose. On the right side of the uterus in the illustration (fig. 28) the fimbriated end of the Fallopian tube is plainly seen resting upon the roof of a large excavated chamber formed by the upraised layers of the distended broad ligament. If we trace the tube from the fimbriated end towards the uterus we find that it is soon lost in the expanded roof of the broad ligament chamber. The tube as a tube exists no longer. Its middle third is ruptured and spread out and forms the immediate vault of the pregnancy beneath the peritoneum. It is only with difficulty that we can rediscover some trace of its independent existence on the further side of the broad ligament tumour before it enters the uterus. The fœtus has escaped from its cavernous bed by secondary rupture and is now lying outside the broad ligament. It is still, however, connected by the cord, and if we could trace this upward to its termination we should find the placenta attached to the roof and lateral wall of the cavity in the broad ligament, and plainly situated above the original position of the fœtus which has escaped from it. Note that the placenta is uppermost. The course of events has been as follows:—the impregnated ovum was arrested in the tube; where it was arrested it adhered and vital attachment took place.

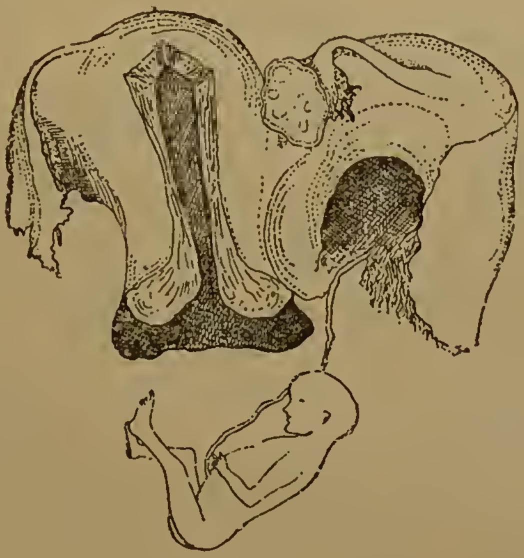

FIG. 28.

At the point of attachment the placenta was formed and no subsequent growth of the pregnancy has separated this attachment. The tube, instead of rupturing upwards into the abdomen, has ruptured downwards into the broad ligament. Into this space the fœtus has been driven and over the buried fœtus the placenta is fixed and blocks any upward progress. What is the inevitable consequence? If the pregnancy continues to develop either secondary rupture must occur or the peritoneum be continually displaced to make room for the growing fœtus. In this instance the case has ended by secondary rupture and the patient has

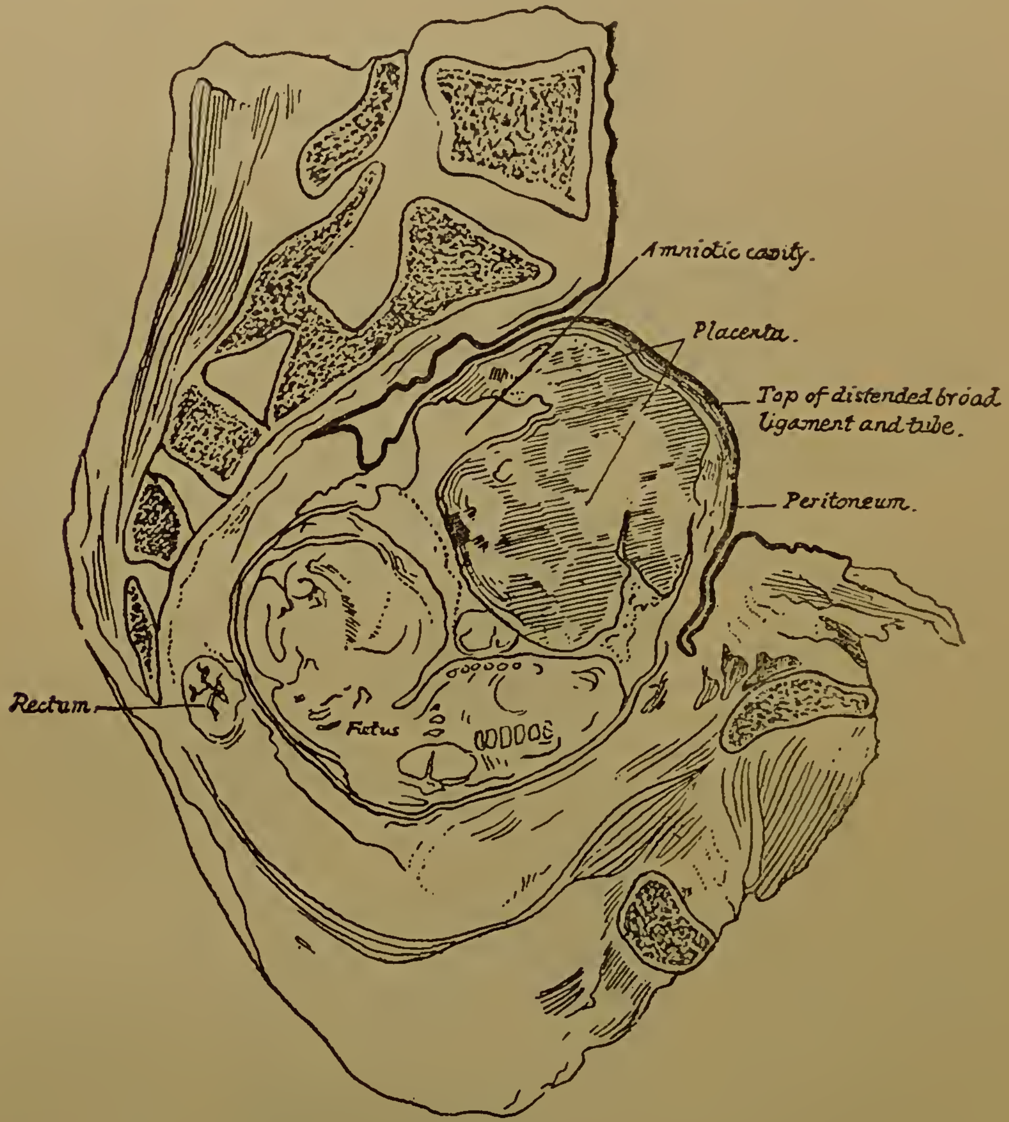

Fig. 29.

evidently died from hæmorrhage or we should not have such a specimen before us.

Let us now turn to Dr. Berry Hart's and Mr. Carter's sagittal section of a broad ligament pregnancy at nearly the the same period of growth (fig. 29). Here we may see an exactly similar condition beautifully portrayed in section. Mark at the highest point the "top of the distended broad ligament and tube"; below this, intimately attached and inseparable from the tube, the mass of the placenta, and again below this, crowded and buried in the lowest part of the pelvis, the unfortunate fœtus. Illustrations intended to show in section the peritoneal reflexions are sometimes confusing and difficult to understand, but this is exceedingly simple and intelligible. The pelvic peritoneum is lifted by the growth of the pregnancy until it is no longer pelvic, or only slightly so. Its reflexions before and behind are shallow depressions only, and the arch of it runs across from the promontory of the sacrum to the pubes. In this instance, too, the case ended by secondary rupture and the patient died from hæmorrhage, though an attempt was made to save her by exploratory incision. Some of the clinical and operative features of a case at this stage may be gathered from the following example:—

Mrs. H., aged 31 years, had been married for three years. She miscarried in April, 1891, and in February, 1892 (at twelve weeks). She menstruated regularly from this date until July, 1892, the last normal period being at the end of this month. Amenorrhœa followed, continued for nearly eight weeks, and was again succeeded by irregular vaginal loss for some two weeks before I saw her on October 10th. The patient gave the history of a sudden attack of pain three weeks before on returning from church in the evening, violent abdominal pain and vomiting being the chief symptoms. This pain was repeated on the following Thursday and Saturday, and to a less extent twice during the week that had just passed. On examination I found the abdomen slightly distended and a hard tumour to the right of the middle line above the pubes. The uterus was of normal size, pushed to the left and fixed there. A pelvic mass to the right of the uterus was felt to be one with the supra-pubic swelling and only slightly movable together with the uterus. The pouch of Douglas was moderately distended with fluid. The patient was feeble; the temperature on the evening of the 9th had been 100° F., and the pulse had been 120. The diagnosis was made of intra-peritoneal hæmatocele and free blood in the pouch of Douglas due to the rupture of an extra uterine pregnancy. Operation was performed on the morning of October 11th, 1892. There were present Dr. Leslie Phillips (who assisted me), Dr. Edge, Dr. de la Chérois, Dr. Williams and Dr. Addenbrooke. Free fluid blood welled out on opening the abdomen. A ruptured pregnancy was found in the right broad ligament filling up the right side of the pelvis. The hæmorrhage from this (into the abdomen) had been partly confined by adherent, inflamed, and greatly thickened intestine. On separating this the outer coat of the bowel was at one part slightly torn, and this was sutured with a continuous Lembert suture. A large mole of pregnancy was removed from the right side of the pelvis and the blood and blood clot thoroughly washed out with warm water. No pedicle offered itself for ligation, as the pregnancy had been sub-peritoneal. The pelvis was drained. At the close of the operation, although very little blood was coming through the drainage tube, the patient's condition was very serious. The pulse was 156. Nutrient enemata were ordered to be given every four hours. In the evening the pulse was still 156. On the morning of the 12th the pulse was 148; at 6 p.m. it was again 156. On the morning of the 13th the pulse was 144. At 4 p.m. on this day the bowels were moved, and the pulse fell to 129 at night. From this date recovery, although slow, was uninterrupted.

In abdominal disease a persistently high pulse rate is more than anything else the gauge of the severity of the patient's condition. It is worthy of notice that the severity of this case was as marked as it could possibly be compatible with final recovery. These cases of broad ligament pregnancy with secondary rupture are always serious. Before operation they cannot be differentiated from the cases of later rupture of the tube already considered, but at operation in the more common tubo-abdominal rupture the hæmorrhage can be at once arrested by ligature of the broad ligament and removal of the tube. In the broad ligament pregnancy with secondary rupture the case is different—there is nothing definite to tie unless one ligates special vessels, the operation takes longer, the surgeon has to trust to pressure and drainage, and the final result is correspondingly less satisfactory and certain.

The tubo-ligamentary or broad ligament pregnancy may go on to term, and in its full development and during the stages by which it reaches that development it differs very materially from the tubo-abdominal or ventral pregnancy, and will need further consideration from almost every standpoint. In tubo-abdominal pregnancy, if the patient survive the fourth month and the dangers incidental to the extrusion of the fœtus from the tube, she is free from further dangerous complications until the term of pregnancy is near its completion. In the tubo-ligamentary, on the other hand, owing to the higher position of the placenta and its liability to detachment from the growth of the pregnancy, the patient is never free from danger, and although many cases of this kind go on to term, secondary rupture and fatal hæmorrhage are by no means uncommon or impossible at almost any stage of the development. In both varieties the period of the third or fouth month is a specially dangerous one, because up to this time the pregnancy has received the support and shelter of the pelvis. When the pregnancy rises out of the pelvis into the abdomen the protection afforded by this is lost, and in the broad ligament form the gradual elevation of the placenta brings an additional source of danger.

If we look at the specimens and illustrations already taken as typical of tubo-ligamentary pregnancy in its earlier stages, it appears as if the peritoneum had been equally separated in all directions by the growing pregnancy, and certainly in Dr. Hart's and Mr. Carter's case of mid-term pregnancy, the perfect arch of peritoneum (seen in section) with a sulcus of equal depth behind and in front, marks the case as one in which the pregnancy has been up to this point peculiarly symmetrical in its growth and in its displacement of the peritoneum But it is not always so. Earlier or later in the history of most tubo-ligamentary pregnancies the tumour tends to invade or displace the layers of the broad ligament and the peritoneum continuous with these unequally. Sometimes it is the anterior fold of peritoneum which suffers the more displacement, and owing to the work of Dr. Berry Hart and Mr. Carter these are the cases which are at present more recognised and better understood. The peritoneum is raised from the back, side, and front of the uterus, it is entirely lifted away from the bladder, it is raised from the anterior and lateral abdominal wall, and in this way a good portion of the pregnancy comes to lie in front of the peritoneum. The pregnancy becomes in some places "sub-peritoneal," according to common anatomical language, and may possibly be opened from the outside of the abdomen without the necessity of incising the peritoneum anywhere. The pregnancy is at first "sub-peritoneo-pelvic," and afterwards (if it continues to grow) "sub-peritoneo-abdominal." It cannot be adequately represented by any mere diagrammatic figure, as the tracing of the actual displacement of peritoneum is intricate and must obviously show considerable variations in individual cases. If, however, we take a sagittal section of the normal abdominal peritoneum to be roughly represented by the accompanying illustration (fig. 30), and if we take the changes produced by a normal (uterine) pregnancy to be represented by fig. 31, the main or essential change produced in it by the growth of this form of tubo-ligamentary pregnancy may be approximately depicted by the following alteration (fig. 32). Now if this diagram be compared with the actual condition found

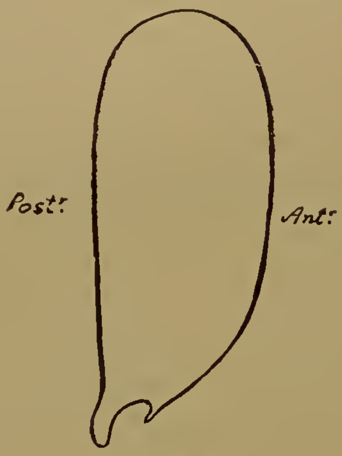

FIG. 30.

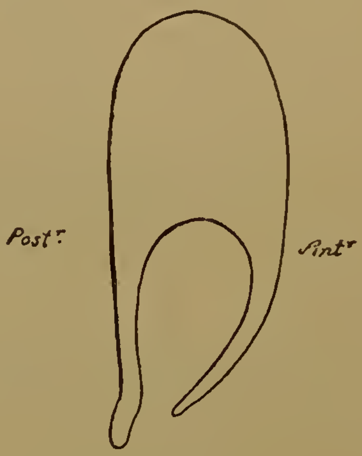

FIG. 31.

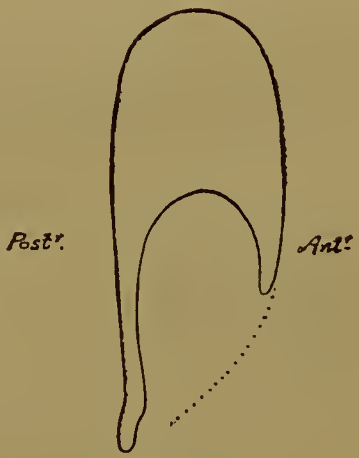

FIG. 32.

in a case of advanced sub-peritoneo-abdominal gestation, as represented in the frozen section illustration, which by the kindness of Dr. Hart I am permitted to reproduce (fig. 33),

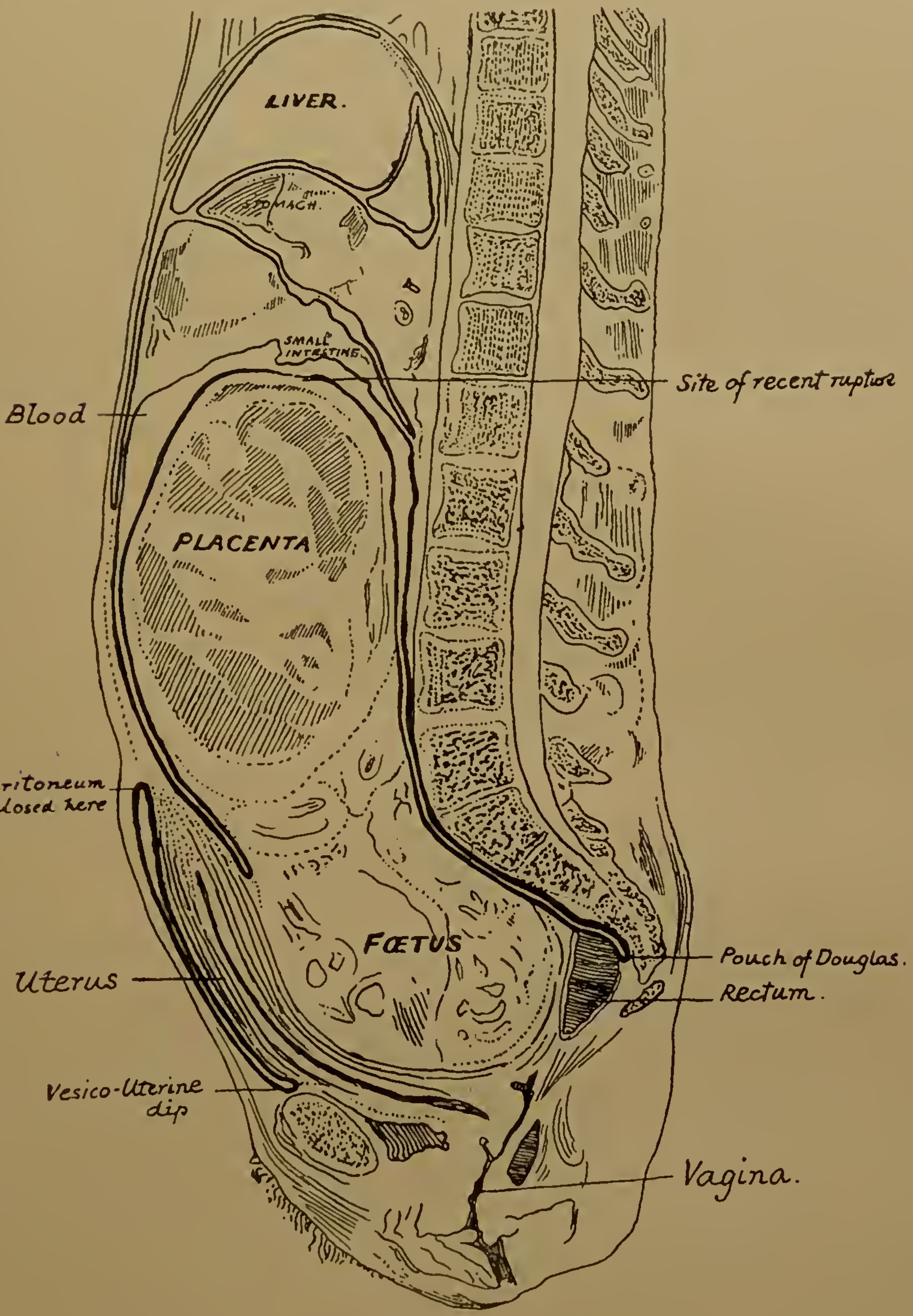

FIG. 33.

it will at once be evident that in both the posterior layer of peritoneum is unchanged and that it can be traced uninterruptedly right down to the bottom of the pouch of

Douglas. It is altogether anterior to this where the displacement of peritoneum has occurred, and although in the frozen section plate this displacement is seen to be complicated by the retention or "survival" of the vesico-uterine fold (apparently cut off from the rest of the peritoneum), yet the general trend of the displacement or lifting is exactly as shown in the illustration. The anterior part of the pregnancy is that more uncovered by peritoneum and might possibly be reached by the surgeon without its section. It is, of course, this form of pregnancy which since it was first fully described has been very generally accepted as accounting for all cases of advanced extra-uterine pregnancy. It is only right to mention that Dr. Berry Hart himself is in no way responsible for this, and that nothing he has written so far as I know affords any foundation for this teaching.

As we have already seen, tubo-abdominal or ventral pregnancy has quite another explanation and is practically distinct from the tubo-ligamentary variety from the moment that the fœtus is extruded from the tube. Now, a considerable body of evidence has formed which tends to show that this sub-peritoneo-abdominal pregnancy which I have been describing is not only quite distinct from ventral pregnancy, but represents only a part, and that perhaps the smaller part, of the cases of true broad ligament pregnancy. For sometimes—and probably in the majority of cases—it is the posterior fold of peritoneum (and not the anterior) which undergoes the greater displacement, and then the condition found in advanced gestation is altogether different. The peritoneum is raised from the side and back of the uterus. It is raised from the pouch of Douglas and from the rectum, and lifted upwards from the posterior pelvic wall as far as the sacral promontory. This appears to mark the usual limit of displacement, and the peritoneum thus raised appears to be sufficient to satisfy the requirements of the growing pregnancy to term. The anterior peritoneum is quite undisturbed, and an illustration approximately depicting the change in the peritoneal relations will have this outline (fig. 34). On opening the abdomen at or beyond the full period of gestation the pregnancy is seen to be everywhere covered by peritoneum much as the uterus is in normal pregnancy, and it is not until the hand is passed behind the sac of pregnancy that one realises that the base of it fills the pelvis on the side from which it is springing, and that the peritoneum is reflected from above the pelvis directly on to the body of the pseudo-uterus. The real uterus is found beneath the sac of pregnancy and pushed to the opposite side. This condition has been recognised for some years as occasionally met with by the surgeon when operating for the removal of an extra-uterine pregnancy at term, but the explanation of the method of its production was until quite recently imperfect or wanting. In 1892 I reported a case and described the condition, drawing especial attention to the intra-peritoneal nature of the gestation sac as viewed from the front after abdominal section. I also drew attention to the breadth of its base and to the position of the uterus, and expressed my conviction that the gestation sac in this variety of ectopic gestation was formed by a "local development of the Fallopian tube and broad ligament."* Absolutely true as this opinion was and practically a rough generalisation of the account I have now presented, there was not at this time sufficient evidence to warrant any detailed history of the local development or displacement of the broad ligament. My own case and others like it had

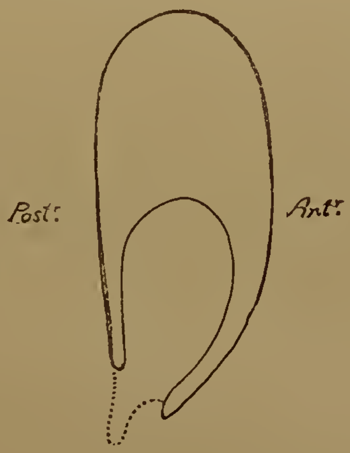

FIG. 34.

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* *British Gynæcological Journal*, August, 1892.

ended favourably and, so far as I am aware, no full or *post mortem* investigation as to the exact relations of the sac had then been made. For more certain knowledge we are indebted to Dr. Dunning's* case, in which the sac of pregnancy was enucleated from beneath the peritoneum and the relations of the peritoneum to the sac and the amount and character of its displacement admitted of demonstration. From the record of this case there can be but little doubt that Dr. Dunning is right in his contention that this form of pregnancy is produced in the first place by a retro-peritoneal invasion from the broad ligament, and that the majority of tubo-ligamentary pregnancies belong to this class or subdivision. My own case (already referred to) was as follows :—

Mrs. I. is a married woman, aged thirty-six years, the mother of three children, the youngest of whom is two years of age. The youngest was suckled for sixteen or seventeen months, menstruation recurring regularly during the greater part of the time. About one year ago the periods ceased, and although some hæmorrhagic discharge occasionally took place this was irregular and scanty. The abdomen soon began to swell and the patient supposed that she was pregnant, but she had never clearly felt any movements of the child. On Feb. 17th, 1891, I saw her in consultation with Dr. H. S. Cook and made the following note:—"The patient is very emaciated, sallow, and anæmic. Her tongue is catarrhal and tremulous. Pulse 104 (weak). She is feebly apprehensive, crying out at the thought of any disturbance of position or possible pain from palpation of the abdomen. She has been confined to her bed more than two months with rigors, occasional fever (temperature 102° F.), frequent vomiting and marked prostration. Examination (under anæsthesia): the abdomen is enlarged and prominent, the enlargement being more marked upon the left side. The line of greatest girth measures 42½ in. The enlargement is caused by a firm, well defined swelling, dull on percussion and obscurely fluctuant to touch, which occupies about three-fourths of the superficial abdominal area. It is lateral in position, filling the whole of the left side of the abdomen below the umbilicus and extending over about two-thirds of the right half of the abdomen. The upper limit of the tumour is circular or crescentic in outline, it crosses the middle line half-way between the umbilicus and ensiform cartilage and is continued downwards over the right half of the abdomen until lost to the right of the pubes. The tumour, so far as it can be examined, forms a regular globe and is tense or resistant to touch except over a limited area to the right of the umbilicus. Here a kind of *ballottement* or rather pressure through fluid to a more solid part beneath, can be distinctly made out. *Per vaginam* the uterus can be felt enlarged, distinct from the tumour, and pushed to the left by it. The cervix is not developed as in the pregnant uterus. The sound passes to 5 in. A large rounded mass can be felt in the pouch of Douglas; this appears to be one with the abdominal tumour. Auscultation of the abdomen for any evidence of placental souffle or fœtal heart-beat is negative. An alternative diagnosis is made of extra uterine pregnancy with dead fœtus or ovarian tumour."

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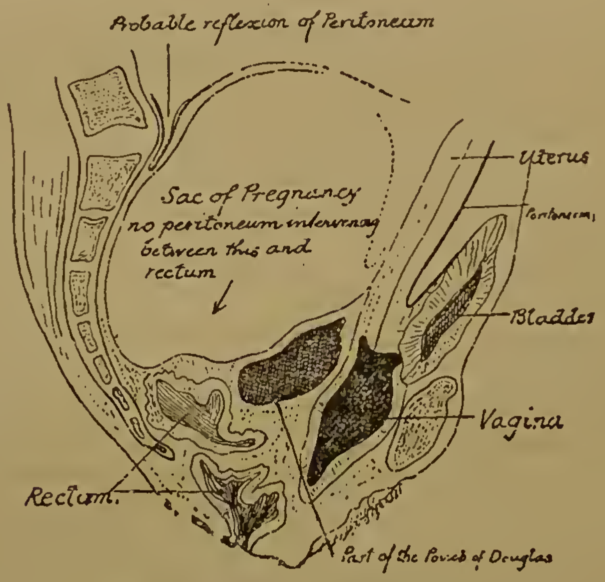
* *American Journal of Obstetrics*, July, 1897.

Operation was performed on Feb. 27th, 1891, when there were present Dr. Leslie Phillips (who assisted me) and Dr. Byron Robinson. I opened the abdomen over the area of least resistance already referred to, feeling assured that by so doing I should avoid the placenta. On dividing the parietal peritoneum, which was free from either displacement or adhesion, the wall of the tumour became visible, dark red or almost purple in colour. The hand could be passed in front of the tumour on either side and down into the pelvis. Behind the tumour it was stopped at the sacral promontory, and the peritoneum appeared to be reflected from the spinal column upwards over the posterior surface of the tumour. I tapped the cyst with an ovariotomy trocar and evacuated several pints of dirty brown fluid. On opening the cyst a child was seen within it, dead and beginning to decompose. I removed it. The child was of full size, and with the exception of some unnatural enlargement of the head, was otherwise well formed. It was of female sex and weighed 6¾ lb. During the removal of the child the sac, which although thick was very brittle, tore slightly in a downward direction, and I noticed that great care was necessary in dealing with it. The upper part was strictly intra-peritoneal and free from adhesions except some to the great omentum, which were easily separated. It appeared to spring from the pelvis, having a very broad base with the uterus underneath it. Its interior was very foul, and after washing this out with boric acid solution I finished the operation by sewing the opening in the sac to the abdominal incision. The placenta was not interfered with. The cord was left hanging out of the wound and the sac was drained. The placenta separated and came away about four weeks afterwards; this took place without any constitutional disturbance. (The patient made a perfect recovery, and has had a subsequent pregnancy perfectly normal in every respect. Jan., 1899).

Advanced tubo-ligamentary pregnancy must accordingly be divided into two sub-divisions or classes:—(1) the anterior ligamentary, sub-peritoneo-pelvic or sub-peritoneo-abdominal pregnancy, and (2) the posterior ligamentary or retro-peritoneal pregnancy. The first is established by post-mortem proof and frozen sections, and does not admit of any doubt or question. The second rests mainly on operative evidence, but that evidence is confirmed by more than one operator, my own experience being exactly similar to that of Dr. Dunning, and I have very little doubt that in time this will be supplemented by the confirmatory evidence of post-mortem dissection. Indeed, I have considerable grounds for believing that such evidence is already to hand and may be recognised in quite an old acquaintance, viz., the frozen section of an extra-uterine pregnancy, which is figured in Dr. Hart's and Dr. Barbour's "Manual of Gynæcology," 1883, pp. 562-3 (fig. 35). In a recent visit to Edinburgh, when looking over the preparations belonging to Dr. Hart and Dr. Barbour, I was struck by the fact that in this section no trace of peritoneum could be found between the sac of pregnancy and the sacrum or rectum, and on more closely examining it with Dr. Barbour the condition found appeared to be consistent with the theory that the pregnancy had been tubo-ligamentary, and that on the upper side of the section or the part removed the pregnancy had entirely lifted the peritoneum away from the pouch of Douglas and the rectum, while in and beyond the level of the section some remains of the pouch of Douglas still existed in front of the pregnancy. The pregnancy itself was therefore strictly posterior-ligamentary or retro-peritoneal, and we have accordingly anatomical as well as surgical evidence of the existence of this as a special form of pregnancy. If we turn again to figure 25 we shall see, I think, that this must also have been an example of the poste-


Probable reflexion of Peritoneum
Uterus
Peritoneum
Sac of Pregnancy no peritoneum intervening between this and rectum
Bladder
Vagina
Rectum.
Part of the Pouch of Douglas

Dr Barbour's Frozen Section.

FIG. 35.

rior or retro-peritoneal form of broad ligament pregnancy. Although the bony pelvis is not present the position of the sac as regards the uterus and rectum appears to make any other interpretation quite impossible.

There are two points worthy of further notice in the progress of a tubo-ligamentary pregnancy towards "term." The one relates to the development of the sac, the other to the position and integrity of the child and placenta. In the earlier months space for the growing pregnancy is gained (as we have seen) almost entirely by displacement of the peritoneum, and this may be continued more or less throughout the whole period of gestation. In the later months another process of accommodation takes place, and further space is obtained rather by development and extension, or dilatation of the sac already formed, than by further invasion of sub-peritoneal tissues, so that at term, although the pregnancy is entirely outside the peritoneum, it is not much more so than when *in utero*. For it must be remarked that every normal intra-uterine pregnancy is from the anatomical standpoint entirely sub-peritoneal throughout, and yet the distended uterus forms an intra-peritoneal tumour. Similarly, although the base of the broad ligament pregnancy is entirely below the peritoneum, in most cases the upper part of the sac is intra-peritoneal and forms a tumour of considerable size. This applies to both forms of tubo-ligamentary pregnancy, particularly to the posterior or retro-peritoneal, where the sac of pregnancy forms a pseudo-uterus, which is almost entirely an intra-peritoneal tumour. To a less extent it may be seen in the sub-peritoneo-abdominal form also. If we turn again to the illustration (fig. 33) of Dr. Berry Hart's and Mr. Carter's case of advanced tubo-ligamentary gestation, we find that the fœtus is crowded down into the pelvis and mainly beneath the peritoneum, but the upper pole of the pregnancy containing the placenta reaches high into the abdomen and forms an intra-abdominal tumour covered by unbroken peritoneum and very comparable to the tumour formed by a pregnant uterus at a similar period of gestation.

With regard to the placenta, I have only to draw attention to my belief that its position is inseparably bound up with the position of the Fallopian tube and that its final resting place is therefore also the final resting place of the tube. In the large section of advanced pregnancy figured by Dr. Hart and Mr. Carter, traces of muscle tissue probably belonging to the tube were found, as Dr. Hart has told me, at the very top of the gestation sac. And this section shows, I believe, the greatest displacement of the placenta on record. In my opinion the original relative positions of the child and placenta are fixed at the time of invasion of the broad ligament or abdomen. In tubo-abdominal or ventral pregnancy the child is uppermost. In tubo-ligamentary or broad ligament pregnancy the child is undermost, its relative position to the placenta being fixed by the relative position of the tube to which the placenta is attached. If the relative position alters during the course of the pregnancy, as it evidently does to a considerable extent in the later stages of the posterior ligamentary or retro-peritoneal form of tubo-ligamentary pregnancy, it is because the sac develops posteriorly to the tube and therefore affords room for the child to pass behind the placenta and so attain a higher position. Similarly, in the sub-peritoneo-abdominal form it may be quite possible for the child to pass in front of the placenta during the later stages of its growth. If the placenta occupy the highest part of the sac during the later stages of pregnancy it affords evidence of extreme dislocation of the tube, and such a case is liable to hæmorrhage and rupture, however far advanced the pregnancy may be. The placenta will suffer from local hæmorrhage and the pregnancy will be liable to terminate disastrously before the full period of development. In those cases which go to "term" the placenta is usually fully equal to the nutrition of the child, and though much has been written on the faults and lesions of the extra-uterine placenta as responsible for failure and defects of the extra-uterine fœtus, I cannot say that the relationship appears to me to be by any means established. So far as my own experience goes, the extra-uterine child at term, in size and weight and general nutrition, is in no way behind the average. But the child is often locally defective or malformed, such defects or malformations almost invariably corresponding to some long continued pressure exerted by the bony skeleton of the mother on the extra-uterine fœtus. These malformations are most commonly met with in children of abdominal or ventral pregnancies. The children of ligamentary pregnancies, and particularly those of the posterior variety, may be free from any visible defect whatever.

NOTE ON ATYPICAL CASES OF TUBO-LIGAMENTARY PREGNANCY.

In placing the essentials of tubo-ligamentary pregnancy before the reader it has been necessary to take cases of clear and well-defined type as examples for our study.

From the remarks that have been made regarding the variations of peritoneal displacement and the "development, extension or dilatation" of the sac already formed by the tube or tube and broad ligament (p. 79), it will be easy to understand that atypical cases may arise in which either the displacement of the peritoneum is very much in excess of the intra-abdominal development and extension of the sac, or in which this development of the tube and mesosalpinx is altogether predominant, necessitating but little peritoneal displacement ; so that, at full term, the one pregnancy may be almost universally buried beneath peritoneal reflexions, while the other pregnancy may form a pediculated intra-abdominal tumour exceedingly similar in its relations to many ovarian or par-ovarian cysts.

To this latter class of pregnancies belong most of those cases in which, at operation, it has been found easy to remove the entire sac of pregnancy including both fœtus and placenta (Howard A. Kelly, *Operative Gynæcology*, vol. ii., p. 462 ; Mayo Robson, *Medical Press and Circular*, March 1, 1899).

In some of these it almost appears as if the pregnancy had remained tubal throughout, with but little if any real broad ligament invasion.

CHAPTER IX.

Tubo-Uterine Pregnancy (*syn.*, Interstitial Pregnancy).

Tubo-uterine or interstitial pregnancy is a rare condition, and there are only a few specimens which are readily available. Strictly speaking, this pregnancy is not really extra-uterine or only becomes so by rupture into the abdomen, but the pregnancy is "ectopic," outside the uterine cavity, and it is perhaps the most dangerous of all the forms of ectopic gestation. In most of the specimens of this disease or accident it appears to be the tissue on one side of the fundus which is mainly invaded by the growing pregnancy. The obstruction to the passage of the impregnated ovum and its primary attachment is probably exactly at the uterine ostium of the tube. This refuses to admit the passage of the "oosperm," the ostium is pushed before the growing ovum as it increases in size, and a burrow is formed into the uterine tissue (above or to one side of the cavity of the uterus), where the pregnancy finds a temporary resting place and bed. This naturally raises the height of the uterus on the side affected, and in all the specimens I have seen the asymmetry produced by this has been very noticeable, the Fallopian tube of the non-affected side appearing to enter the uterus at a lower level midway between the (altered) fundus and cervix. In one of the best known specimens (No. $2{,}517^{90}$ of the Guy's Hospital Museum), the uterine appendages of the opposite side appear to have been removed, with the unfortunate result that this asymmetry is not readily recognisable. The sac of pregnancy appears to lie across the fundus from right to left, and this is decidedly the impression given of the specimen by the illustration in Mr. Bland Sutton's book.[*] In reality, however, as the following more recent sketch (fig. 36) will show, the unaltered part of the fundus lies altogether to one side of this sac of pregnancy, and the raw surface where the opposite appendages have been removed shows that there is quite as much distortion in this specimen as in that of the Royal College of Surgeons of England (4,691), the other specimen in Guy's Hospital Museum (2,517^{65}), and in the specimen presented by Mr. Tait now standing in the Mason College Museum (fig. 37). All show alike that the Fallopian

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[*] "Surgical Diseases of the Ovaries and Fallopian Tubes," 1891 (fig. 103, page 349).

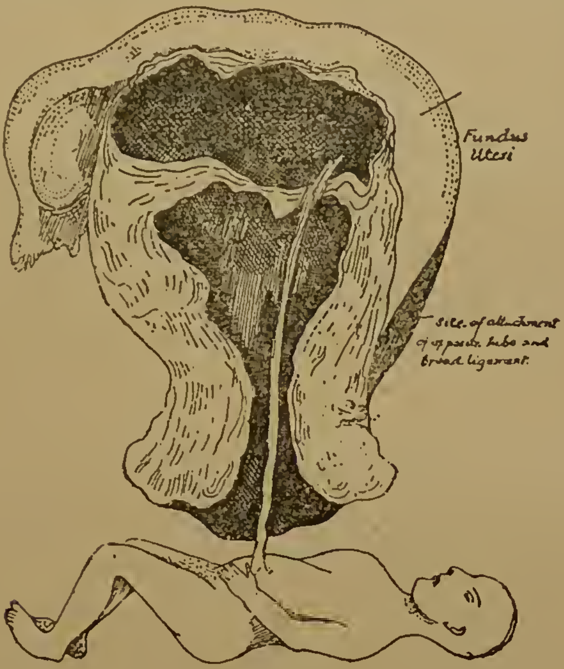

FIG. 36.

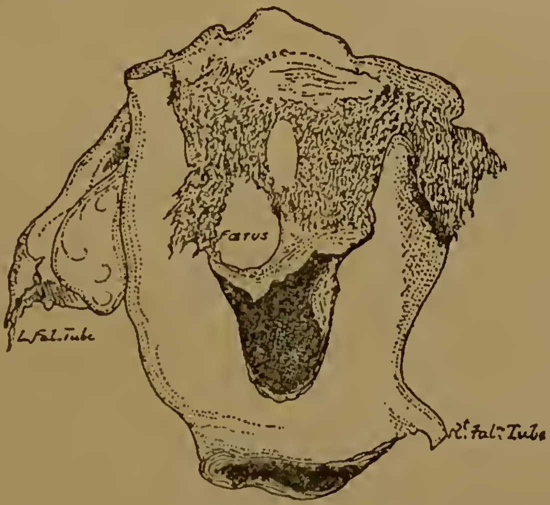

FIG. 37.—Upper part of Uterus (and pregnancy) removed.

tube and fundus of the side affected are very considerably raised above the level of the fundus and appendages of the opposite side, and that the tubes accordingly appear to enter the uterus at different levels. This asymmetry may be simulated by pregnancy in one part of a double uterus or by cornual pregnancy in a bi-corned uterus, and, indeed, several supposed specimens of interstitial pregnancy have been found on close examination to be of this nature. In both of these conditions, however, there is always some angle, more or less well-marked, where the double organs join, and this is of course absent in a tubo-uterine pregnancy.

A tubo-uterine pregnancy may continue to grow for several weeks to the end of the fourth month or even longer, between uterine peritoneum on the one hand and uterine mucous membrane on the other. Sooner or later rupture takes place, either downward into the cavity of the uterus or upward into the abdomen. The former method of rupture is a highly probable occurrence, and if it occurred would presumably be followed by spontaneous healing of the wounded tissue and normal delivery at term, but in spite of the slenderness of the bridge of tissue usually existing between the sac of the pregnancy and the cavity of the uterus we have no positive demonstration that this has ever taken place alone. The only rupture that is known to occur is rupture into the abdomen (or into the abdomen and uterus simultaneously), and the result of this is always appalling. Diffuse hæmorrhage, worse (if possible) than that which takes place with early rupture of the tube, is the main feature of the pregnancy, and hitherto this has always proved fatal in a very few hours. The only case approaching or possibly belonging to this class which I have met with in the living subject is the thirty-second of my series.

Mrs. J., aged 27 years, has been married for seven years. She has had three children, the youngest of whom is 19 months old. She was "regular" until May 6th, 1896, and since this date (until Sept. 10th) has had almost constant discharge of brownish blood. During the latter part of this time she suffered from abdominal pain and tenderness. Early in September this notably increased, and the severity of the pain necessitated her confinement to bed. On Sept. 8th I saw her and found the abdomen distended and acutely tender. A fixed hard tumour was felt on the left side, having a crescentic outline and occupying the whole of the left inguinal region. On vaginal examination the mass was felt to be one with the uterus, but on passage with the sound no increase was found in the length of the uterine cavity. The patient stated that the swelling was rapidly increasing in size and the lump in the abdomen had only been noticed for a few days. The patient's lips were pale and her pulse was rather quick and feeble. A diagnosis was made of left tubal pregnancy with hæmatocele, and operation was done on Sept. 10th, 1896. On opening the abdomen a large sac was exposed formed by the expanded left cornu of the uterus, the left tube and the left ovary, and containing placental remains. This was adherent to omentum and intestine, the union with the latter being so intimate that separation had to be made by incision. When the sac was fully freed, opened, and cleaned, it was seen that the inner part of the pregnancy had apparently invaded the uterine tissue of the cornu, and this, together with the base of the sac and broad ligament, was ligatured off from the rest of the uterus in four sections, leaving a long oblique wound on the left side of the fundus. The hæmorrhage was then controlled and the abdomen was closed, a drain being left in the pelvis. The patient made a good recovery.

On examination of the specimen removed it appears, I think, as if the pregnancy had been originally purely tubal and (probably) a pregnancy of the outer part of the tube, that it had become firmly adherent to the uterus and ovary, and had quite secondarily invaded the side of the uterus in process of growth. If so, it is a special form of tubo-uterine pregnancy, which at present is unrecognised and certainly demands our attention. A specimen recently shown to me by Dr. Cullingworth, and already referred to, appears to me (at all events, so far as I have been able to examine it) to be of the same nature as regards the invasion of the uterus. This specimen is one in which a tubal (or tubo-uterine) pregnancy has been complicated with myoma of the uterus. The fœtus is contained in a curious diverticulum of the tube, while the placenta appears to have invaded the substance of the uterus. The upper part of the uterus (containing both pregnancy and myomata) was removed by hysterectomy, and the following is a rough sketch of the parts removed (fig. 38). In this case there had been no intra-peritoneal bleeding at the time of operation. Whether Dr. Cullingworth would agree with me or not I am unable to say, but it appears to me that this is (like my own) a tubal pregnancy which has quite secondarily invaded the uterus.

There are then, I believe, two varieties of tubo-uterine pregnancy: the one, "primary," long recognised under the term of "interstitial," and hitherto regarded as the only kind of tubo-uterine pregnancy; the other, "secondary," caused by later invasion of the uterus from the tube and mainly involving the uterus by the growth of its placenta or by a burrowing hæmorrhage connected with this growth.

In some of the older statistics of extra-uterine pregnancy cases of "interstitial" pregnancy figure largely and in far higher proportion than in any statistics obtained from later experience. Thus in Parry's 500 cases 31 are stated to have been "interstitial," while in Hennig's list of the same date (1876) in 150 cases 42 are reckoned as interstitial. These numbers must almost necessarily be largely mistaken, since any recent specimen is only of rare occurrence, and it is highly probable that some tubo-ligamentary and cornual pregnancies have been included by mistake. When a specimen is difficult to place, the position of the round ligament with regard to the pregnancy is sometimes of service in deciding its true character. This should be on the uterine side of a tubal or tubo-ligamentary pregnancy, while it

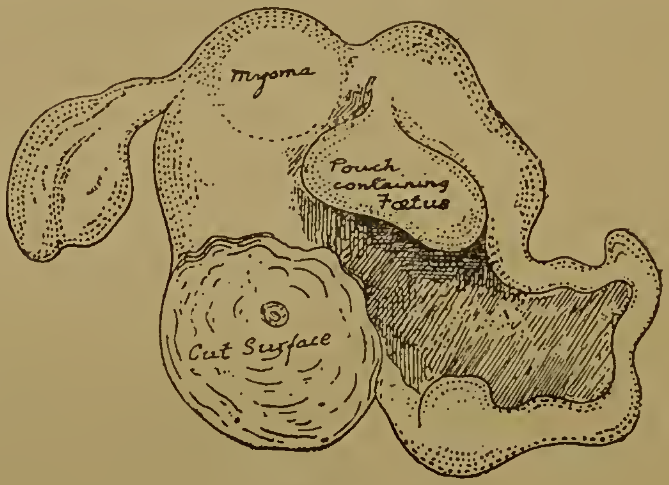

Fig. 38.*

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* Fuller illustrations of Dr. Cullingworth's case may be found in his paper in the *Obstetrical Transactions* for 1898, pp. 285-294.

should be on the other side or in the anterior wall of an interstitial or cornual pregnancy. The position of the round ligament as a guide to the differentiation of cornual pregnancy was first pointed out by Virchow, afterwards utilised by Professor Sir William Turner of Edinburgh, and has proved of very great value. It is not, however, an infallible guide. I have quite lately seen an intra-ligamentary tumour in which a large mass of the tumour was bulging between the round ligament and the uterus. The normal relations had been so altered by the growth of the tumour that what should have been the uterine end of the round ligament was lost on the surface of the tumour, and no direct connexion could be traced between the round ligament and the uterus. Yet the latter was intact and the tumour was removed without any injury to the uterus. This occurred in the hospital practice of my colleague, Mr. J. Furneaux Jordan (February, 1898).

CHAPTER X.

Review and Classification.

We are now in a position to review the ground which we have already traversed, to recognize the consequences of the various positions which one by one have been established or taken as established, and to consider the explanation of some of the phenomena that have as yet been only described. We have seen that all extra-uterine pregnancies are originally either *tubal* or *uterine*—that many intra-uterine (or normal) pregnancies may actually begin as extra-uterine, the ovum being impregnated while passing down the tube, and that very rarely an advanced extra-uterine pregnancy may begin as intra-uterine—passing its early stages within the uterus (*see* Note on Utero-abdominal Pregnancy).

The causes of tubal pregnancy are uncertain, but mechanical difficulties in the passage of the oosperm down the tube appear to be of chief importance. Of these, an atrophic condition of the tube due to hyper-involution or congenital want of development is worthy of special recognition as bearing on the phenomenon of early rupture.

All pregnancies that go to term, whether intra- or extra-uterine, may be proved on close examination to have had an intact amnion. Any supposed absence or imperfection of the amnion is apparent and not real; consequently one important and perhaps essential condition of a living pregnancy is the presence of unruptured membranes. Soon after the membranes are broken the pregnancy ceases to grow and comes to an end so far as its life is concerned.*

In all pregnancies the placenta, by its attachment, is necessarily fixed, while the fœtus, enclosed in its amnion, has a power of movement, extension or "invasion" that is scarcely limited except by the size of the cavity into which it extends. Consequently, any supposed migration of the placenta is rather apparent than real. Apart from accidental detachment the placenta can only move from its original position by taking its base of attachment with it. The placenta therefore remains essentially "uterine" or "tubal" throughout.

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* An interesting case of tubo-abdominal pregnancy has recently been reported by Mr. Bland Sutton in which the amnion had ruptured and the child was still alive at the time of operation, (*Obst. Trans.* vol. xl. p. 308.)

The various positions, or rather appearances, of the placenta in extra-uterine pregnancy are all formed by variations of uterine or tubal attachment, and, complicated as the description may seem of the placental relations observed in tubo-abdominal pregnancy, these are probably all capable of a very simple explanation.

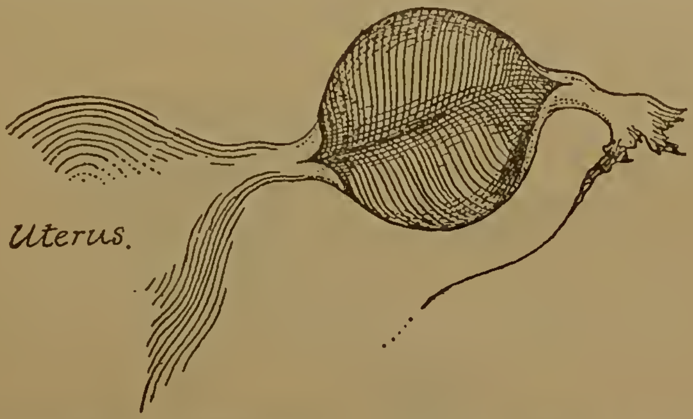


FIG. 39.—Diagrammatic representation of the ruptured tube opened out so as to form attachment for a discoid or flat placenta.

In all of these cases the placenta grows from the inside of the tube. In the simplest form the tube is unruptured, or the rupture has been small and the tube still surrounds the placenta as a more or less complete covering or sheath (fig. 24).

In the next form, (figs. 23 and 39) the tube is ruptured widely and the inside of the tube with its attached placenta, is spread out broad and flat like a disc or plate. In consequence of this the amnion covering the fœtal surface of the placenta is reflected at the outer margin of the disc and the under surface of the placenta when peeled away from the tube or its remains, is raw and irregular as in normal pregnancy. The placenta with this original attachment can grow marginally beyond the limits of the tube. In this way it often becomes attached to the summit and posterior wall of the uterus.

In the other form, (figs. 22 and 40) the tube has not only ruptured widely and opened out into the abdomen, as in the last condition, but it has done more than this. The flaps of spread out tube covered by placenta have apparently turned over (like the petals of an over-blown flower) with the necessary consequence that the smooth, glistening, amnion-covered surface of the placenta is not confined to one aspect of it only, but the amniotic membrane appears to cover the whole of the placenta except the stalk or ridge of broad ligament where the main vessels enter. In this way, it seems to me, the condition has been produced which is described in detail on pages 50-52.

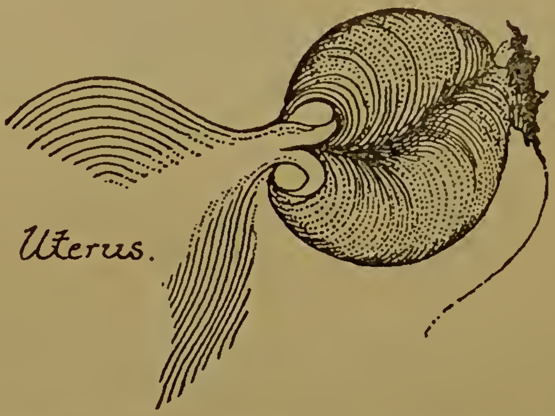


Fig. 40.—Diagrammatic representation of the ruptured tube turned almost "inside out" so as to produce by its attachment to the placenta, the intra-amniotic form described on pages 50-51. (Note the fimbriated end of the tube and compare this with the description of the placenta on page 52).

The positions of the placenta in tubo-ligamentary pregnancy, always growing from the inner surface of the tube which has ruptured downwards into the broad ligament, but sometimes rising upwards with the expansion of the sac and roofing in the pregnancy, as in figure 33, at other times remaining almost stationary while the fœtus passes by it in its growth, have been already thoroughly described and explained, so that all the variations of the placenta at term are capable of easy interpretation, and the process by which the placenta assumes its final situation and appearance may be traced back through all stages to the unruptured tube or uterus, from which it obtained its first attachment and to which it clings throughout.

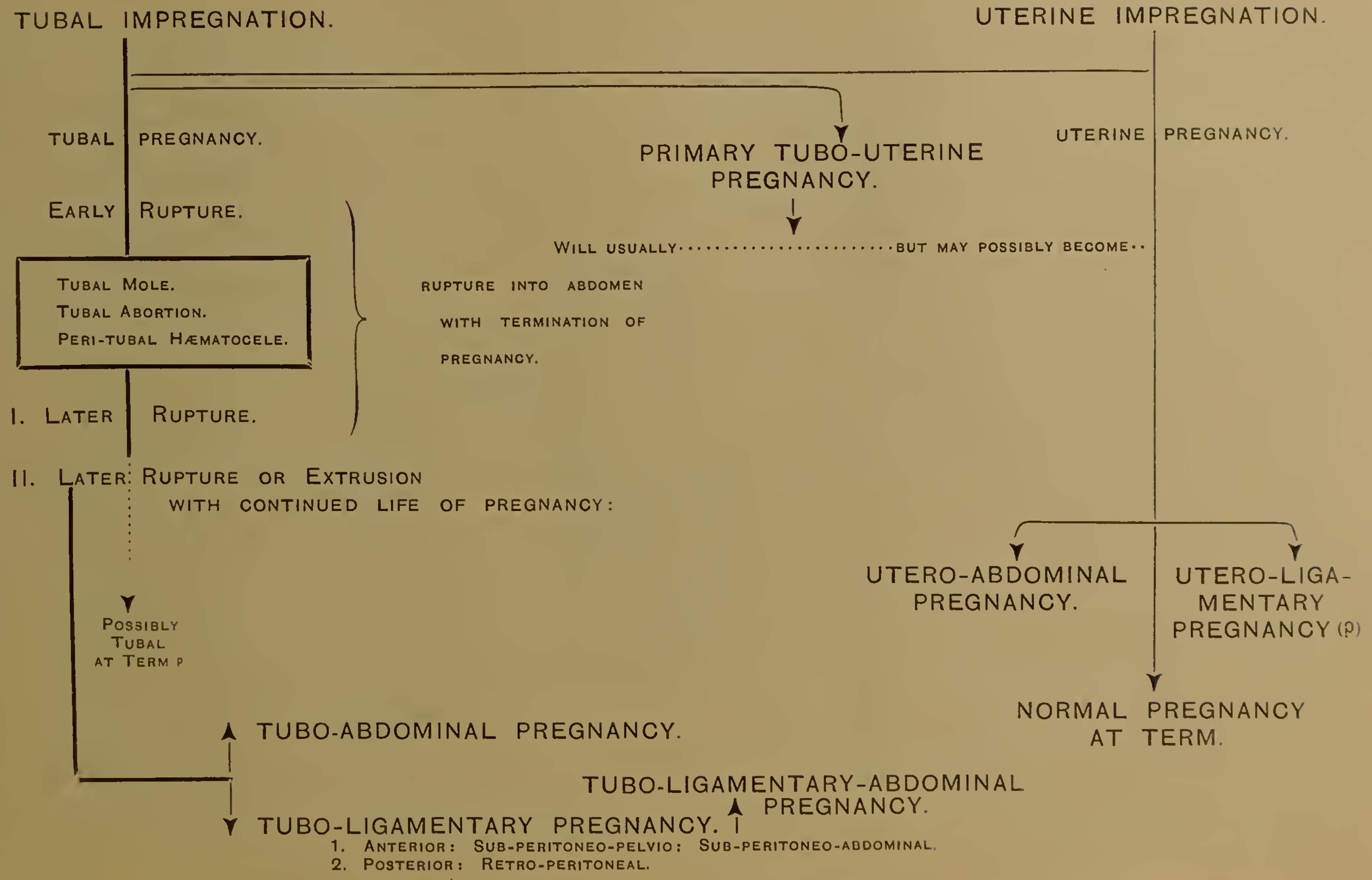
This permanent relation of the placenta to its original site was strongly maintained by the late Dr. J. Matthews Duncan. He wrote:—"The original site of an extra-uterine gestation is determined by the insertion of the placenta. There is no other site of placental insertion but the original site, no reason to believe that the placenta ever does or ever can change its site. It cannot be transplanted" (*Lancet,* July 13th, 1889). In the essentials of this argument I believe Dr. Matthews Duncan to have been correct. The placenta may spread marginally beyond its original site, but short of complete detachment by hæmorrhage, it never entirely loses its original relations. The recognition of this law affords a clue, by means of which the most complicated forms of pregnancy may often be thoroughly explained and the most difficult operations for their treatment carried to a successful termination.

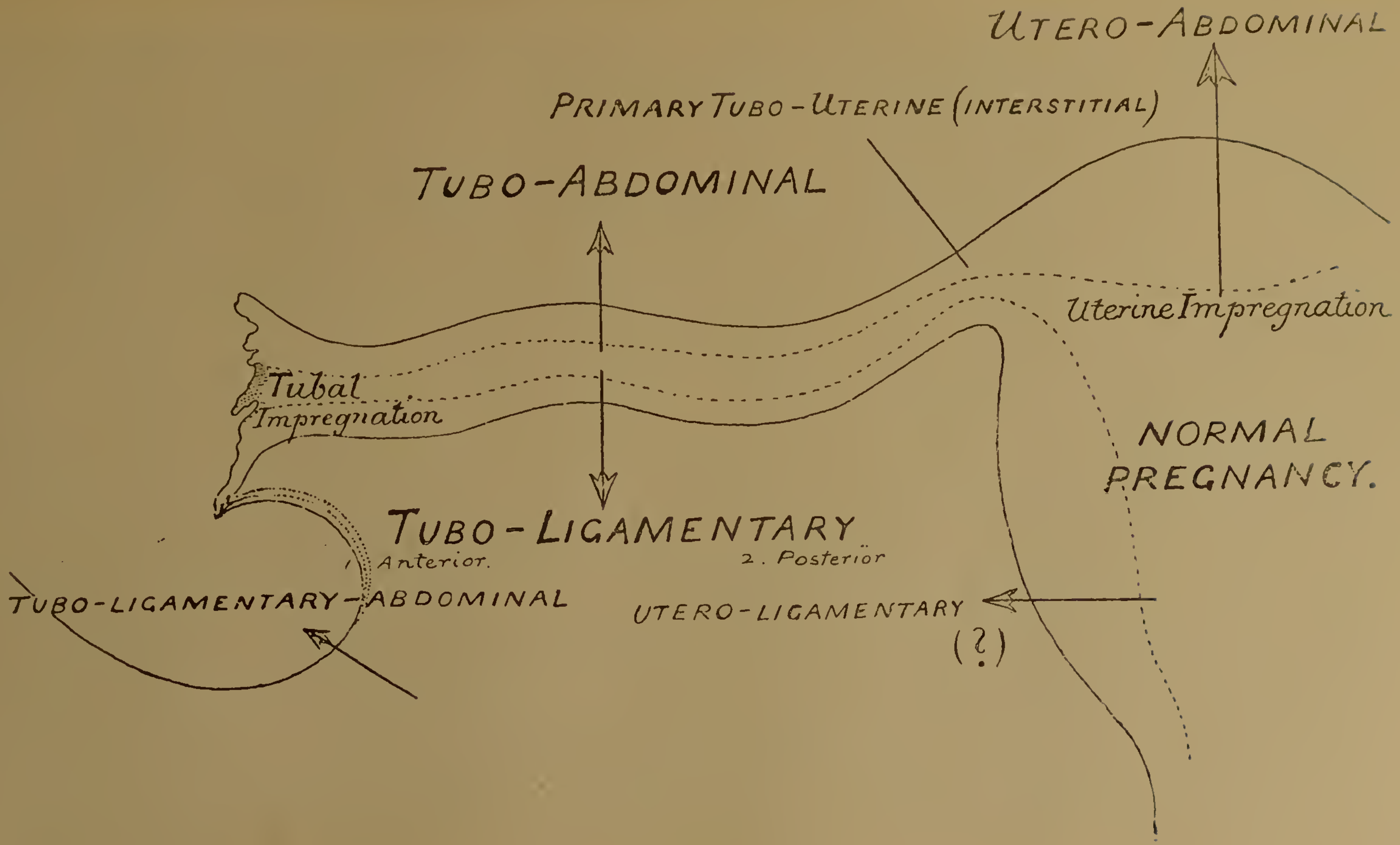
The following table is intended to shew the various forms of pregnancy that may arise from tubal or uterine impregnation and also their mutual relations.

The only form of pregnancy which has not been considered in the text and yet is given a place in the scheme is the hypothetical form of "utero-ligamentary" pregnancy.

No case of this pregnancy has been hitherto recorded, but now that the fact of "utero-abdominal" pregnancy has been thoroughly established, it seems quite possible that the pregnant uterus might rupture below the peritoneum, and the fœtus (in its membranes) be extruded into the sub-peritoneal tissues as in intra-ligamentary pregnancy.

In anticipation of some case being hereafter recorded a place has been assigned to it in the table now given :—


TUBAL IMPREGNATION.
UTERINE IMPREGNATION.
TUBAL PREGNANCY.
PRIMARY TUBO-UTERINE PREGNANCY.
UTERINE PREGNANCY.
EARLY RUPTURE.
WILL USUALLY……………………BUT MAY POSSIBLY BECOME…
TUBAL MOLE.
TUBAL ABORTION.
PERI-TUBAL HÆMATOCELE.
RUPTURE INTO ABDOMEN WITH TERMINATION OF PREGNANCY.
I. LATER RUPTURE.
II. LATER: RUPTURE OR EXTRUSION WITH CONTINUED LIFE OF PREGNANCY:
UTERO-ABDOMINAL PREGNANCY.
UTERO-LIGAMENTARY PREGNANCY (?)
POSSIBLY TUBAL AT TERM ?
NORMAL PREGNANCY AT TERM.
TUBO-ABDOMINAL PREGNANCY.
TUBO-LIGAMENTARY-ABDOMINAL PREGNANCY.
TUBO-LIGAMENTARY PREGNANCY.
1. ANTERIOR: SUB-PERITONEO-PELVIO: SUB-PERITONEO-ABDOMINAL.
2. POSTERIOR: RETRO-PERITONEAL.


UTERO-ABDOMINAL
PRIMARY TUBO-UTERINE (INTERSTITIAL)
TUBO-ABDOMINAL
Uterine Impregnation
Tubal Impregnation
NORMAL PREGNANCY.
TUBO-LIGAMENTARY
1. Anterior.
2. Posterior
TUBO-LIGAMENTARY-ABDOMINAL
UTERO-LIGAMENTARY
(?)

CHAPTER XI.

DIAGNOSIS.

(1). OF EARLY AND "DISTURBED" PREGNANCIES.

WHEN extra-uterine pregnancy is present and has by its symptoms driven the patient to seek for advice, at every stage—up to "term" with death of the fœtus—there are certain indications to be derived from history, symptoms, and physical signs, which are sufficient in most cases to establish a correct diagnosis. In my own series of 42 cases a correct diagnosis was formed in 32 cases. In one case (the first case) no diagnosis was made. In 3 cases the diagnosis was made of tubal disease only. In 2 cases the diagnosis was made of myoma. In 4 cases the diagnosis was made of ovarian cystoma. Three of these were instances of ovarian cyst complicated by the co-existence of tubal pregnancy, and in one of these an alternative diagnosis was recorded of ovarian cyst or tubal pregnancy. In only three of the cases was the diagnosis absolutely mistaken, and in two of these, and even in some of the cases of imperfect diagnosis, I think it may be said with perfect truth that the fault was my own, and that imperfect knowledge, carelessness, or some false suggestion at the outset was responsible for the blunder. The omissions or mistakes which I have just enumerated are necessarily confined to cases on which I have operated. I believe I know of two other cases in which I did not fully recognise the condition and therefore failed to do my duty. The one was a case of diffuse hæmorrhage—probably from early rupture of the tube. The patient was quite pulseless when I was called to her, and although there was some history of delayed menstruation I could not find on examination any pelvic tumour or physical sign pointing to a misplaced pregnancy.

I did not know at that date that in some cases of very early rupture this may be entirely wanting. I was uncertain and the possible moment for action was lost. The other case was one of early tubo-ligamentary pregnancy. The patient was herself suspicious that something was not right about her pregnancy and asked my opinion. After careful bimanual examination I came to the conclusion that the pregnancy was intra-uterine and normal and reassured the patient. Some nine or ten months after this, I found that the time for confinement had been passed without result and that one of my colleagues had operated on the patient, removing a dead fœtus from an intra-peritoneal sac which was exactly similar to those I have described as posterior-ligamentary or retro-peritoneal. It is worthy of notice that the only case of this kind which figures in my own series (No. 4) had been seen at an early stage of the pregnancy by the same colleague and had been considered by him to be intra-uterine and normal. There is probably some good reason for the occurrence of the same mistake in the practice of two surgeons, both of whom have had special experience of extra-uterine gestation. Again, my operation list does not of course contain any case in which I have diagnosed an extra-uterine pregnancy and found a different condition. Four of such mistakes I can remember. One was a case of retroflexion of the gravid uterus with intra-peritoneal adhesions. This occurred very early in my practice. Two were cases of double pyosalpinx with temporary cessation of the menses; the other case was one of malignant tumour of both ovaries. In this case also there was consequent amenorrhœa. Other cases in which an alternative diagnosis was made, or in which the possibility of extra-uterine pregnancy was entertained will be referred to under "differential diagnosis." Finally, I have to add to my list of successful diagnoses some six additional cases of extra-uterine pregnancy in which the operation was performed by another surgeon. In one of these cases a tubal pregnancy of one side was complicated by a pyosalpinx of the opposite side, the only instance in my own practice in which I have found tubal pregnancy and suppurative salpingitis directly associated. As subsidiary material helping to form my experience I have also to add nearly fifty cases of extra-uterine pregnancy which I have watched during the last fourteen years in the practice of my colleagues.

In considering both the diagnosis and the treatment of extra-uterine pregnancy I shall follow as nearly as possible the divisions already framed when dealing with its pathological history. Our first consideration, accordingly, will be the diagnosis of a case of earliest rupture of the tube with diffuse hæmorrhage. The patient is probably a married woman and one who of course must necessarily be within the limits of the child-bearing period. She has probably been in perfect health until an hour or so ago. She was then suddenly seized with a pain in the abdomen, "as if something had given way inside her." She became faint and collapsed, was sick and lay down on the couch or was assisted to her bed. She was given a little stimulant and for a few minutes felt perhaps slightly better. On reflection the attack did not altogether surprise her. Her proper menstrual period was due last week, but instead of coming on as usual was delayed for some days (an uncommon occurrence for her), and during the last three or four days, although there has been some discharge of blood from the vagina, which for an hour this morning was quite profuse, the period has not come on "properly" or in a customary manner. Such, or something like it, is the history. On glancing at the patient the observant practitioner will probably notice at once the paleness of her countenance and lips and her seriously "passive" expression. This can only arise from simple faintness with but little or no loss of blood or from active hæmorrhage. The pulse will decide it. If from simple faintness, although it may be temporarily lost or difficult to find, the pulse when felt again will be found to be slow and moderately full, while if hæmorrhage be still in progress the pulse increases in frequency as the hæmorrhage proceeds and after a time becomes perceptibly weaker.* Perhaps the normal pulse rate is known, and if so it will be found that it is twenty or thirty or forty beats to the minute faster than is usual and that the ratio is still increasing. This is obviously not due to nervousness or excitement, for the patient is curiously self-contained and quiet. Every now and then the pulse becomes fluttering and difficult to count and at these times there is usually some nausea and vomiting. Between these periods of extra faintness it may temporarily improve in quality, but its rapidity does not diminish so long as the bleeding is unchecked. The temperature is sub-normal. If the hæmorrhage continue unabated a colder greyness slowly creeps over the countenance, the voice becomes feeble, the sight is dimmed, the fingers become white and rather cold, and the patient now speaks but little or only in answer to direct questions. Still, however, the mind remains clear and the patient is often acutely observant of all that passes around her. I have known a patient in this condition, rescued from imminent death by operation, speak afterwards of several things connected with her operation of which at the time it was thought she was practically unconscious. It is needless to try to trace the symptoms any farther—the patient is dying—and if anything is to be done to save her life it must be done at once.

In some of the worst cases (the symptoms of which I have been attempting to describe) there are no pelvic or abdominal signs of any definite importance or certainty. The hæmorrhage may come from a very little swelling near the cornu of the uterus and if the latter be inclined to retrovert the tubal swelling may be inaccessible. The blood is fluid; it is continually pouring or dribbling into the abdomen and the patient never has vitality enough for any kind of inflammatory reaction. In addition, the patient may be stout, the abdominal parietes thick, and a satisfactory bimanual examination be altogether impossible. Then without any sign directly pointing to the tube the symptoms of internal bleeding must be our ground for action. Fortunately, however, in the majority of cases, there is additional, and sometimes abundant evidence to be obtained by careful examination. Sometimes a tumour is to be distinctly felt at one side of the uterus—sometimes a "decidua" has been passed *per vaginam;* usually the pouch of Douglas may be felt distended by blood clot, the sensation of an ill-defined but full and boggy swelling being communicated to the finger of the examiner. In one case I detected absolute fluctuation of the blood through the abdominal walls before opening the abdomen, and other indications of blood in the abdomen may be elicited by percussion—dulness in the flanks very slowly changing with changes of position (Mayo Robson)—while in all cases which survive the first few hours, and in which the bleeding is temporarily checked, there is difficulty in the passage of flatus and motion—the patient suffers from considerable abdominal pain and, in short, the signs are present of peritonitis as well as those of recent hæmorrhage. In these cases it is but very rarely (if ever) that any evidence pointing to pregnancy is to be obtained from the condition of the breasts or areolæ or from the sensations of the patient. These are always feeble and more often wanting in the early stages of extra-uterine pregnancy, and any search for them with reliance on their importance will probably increase doubt at a time when certainty and action are of the utmost value.

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* Minute investigation as to the effect of concealed or invisible hæmorrhage on the pulse-rate will show, I believe, that when hæmorrhage is moderate in amount its immediate or first effect in a healthy person is rather to slightly retard the frequency of the pulse, especially when the patient keeps in the recumbent position. If the hæmorrhage be unchecked this effect never lasts long and it is but rarely that the doctor sees the patient until this stage is over. In half an hour or an hour the pulse begins to rise and goes on increasing in frequency until the hæmorrhage ceases or the patient dies. If the hæmorrhage be rapid and profuse this preliminary stage may be altogether absent.

Now as to differential diagnosis: in a case of early rupture with diffuse hæmorrhage the symptoms are so notably sudden and instant in their origin that there is but small danger of any other affection being suspected save those of similar acuteness. To one unversed in gynæcological disease the idea of poisoning is apt to come uppermost. Gastric or intestinal perforation from ulcer of the stomach or acute appendicitis may also be suspected. In all of these there may be the same sudden onset, but except as a curious and improbable coincidence there would not be the contemporaneous presence of an irregular blood discharge from the vagina, and the history, however poor, of some delay in the appearance of the period. In all of these, too, the immediate pain and distress are much more violent than in hæmorrhage, while in gastric perforation (which usually occurs in young unmarried women) and in acute appendicitis there are antecedent symptoms or attacks which point to the stomach or the appendix as the source of trouble. As a matter of fact the question of these diseases has occurred to those concerned rather as post-mortem doubts and fancies after the patient has died than as serious diagnostic difficulties during life. The chief danger of the practitioner in my own experience has been to under-estimate the importance of the condition before him. The medical attendant has been unaffectedly surprised at the consultant's diagnosis, and in one case he was evidently incredulous until the blood was pouring out of the opened abdomen. It has been the difficulty of making any diagnosis at all rather than the making of a wrong one which has usually been the stumbling block, and in two of my cases a physician was the first consultant who was sent for. In both of these cases I am happy to say the condition was recognised by the physician, and the surgical interference recorded was the result of his diagnosis.

Our next consideration is the diagnosis of unruptured tubal pregnancy, of tubal mole and of peri-tubal hæmatocele, due either to bleeding from the fimbriated end or to later rupture of the tube. In the preceding section, when dealing with early rupture and diffuse hæmorrhage, we found that of the three chief factors which go to form the diagnosis, the symptoms—symptoms of internal abdominal bleeding—were on the whole the most reliable, that the history was of next importance, and that the physical signs of any tumour (although of the utmost value when present) were uncertain and might be practically wanting. As we proceed with our subject and discuss later and still later developments of extra-uterine pregnancy we shall find both history and physical signs increasing in value, and it is to these, therefore, that we shall mainly direct our attention; but at all the stages referred to (except the very latest) diffuse internal hæmorrhage may intervene and add its special signs and symptoms to those already present.

The previous history of the patient—the history before the pregnancy begins—is of some importance. There is a certain amount of well-being of the genital organs which is probably necessary for conception to take place, and in any case of pregnancy, whether uterine or extra-uterine, the patient has usually been moderately well and free from any marked pelvic trouble immediately before the act of impregnation. This period of ante-pregnant or ante-amenorrhœal well-being, which is of little or no importance in normal pregnancy, is worthy of special attention when there is a possibility of misplaced pregnancy, because the tumours with which this is liable to be confounded have usually some history of illness rather than of health immediately preceding their formation. Again, in rather more than half the number of cases of extra-uterine pregnancy several years have elapsed since the last normal pregnancy took place, and although the absence of this interval is of no diagnostic significance (as the accompanying tables will show), its presence in a suspicious case may be held as slightly increasing that suspicion, and as being in accordance with the history of other recorded cases.

From the consideration of these two points we pass on to the history of the pregnancy itself. It is obvious that as the duration of the pregnancy increases so must its history be traceable for longer and still longer measures of time, and the chief sign which marks this is the absence of the normal menstrual period—not necessarily the absence of all sanguinolent discharge, but the absence of the normal period in its usual course. Some critical discrimination is often needed in order to arrive at a just conclusion on this point. For instance, in tubal mole (as I pointed out in 1894), there is often no definite history of amenorrhœa—that is, the patient has never gone "over her time" without vaginal loss, and if carelessly questioned, such a patient will probably answer that she has been "regular" throughout, but that the present period is unusually protracted. On closer inquiry (of the same patient) we may, however, probably elicit the fact that the hæmorrhage which has been taking place during the last three or four weeks is very different in character from that of a normal menstrual period, and the patient has no difficulty in fixing a date some seven or eight weeks previously when she was last "properly poorly." Dr. Cullingworth has recently drawn attention to the characters of the hæmorrhage observed in this condition. He writes: "The blood is almost invariably dark in colour, moderate in amount, thickish in its consistence, and steady in its rate of flow. Gushes of bright red blood occur occasionally, but are quite exceptional." I should myself be inclined to question the final statement. Nearly all the cases I have met with possess some history of repeated sharp hæmorrhage. This occurs at irregular intervals and is often copious enough to be spoken of as "flooding" by the patient. It is, however, of short duration, and the bleeding between the attacks of metrorrhagia is usually very much as Dr. Cullingworth has described it. If we add to this that the hæmorrhage is very persistent, and that it may carry with it some shreds or portions of decidual membrane, all its special features have been noticed. Apart from the presence of decidua, the most practical point, in my opinion, is the contrast often afforded by this bleeding to the normal bleeding of the menstrual period in the same individual. The type of menstruation often varies but little for years together, and it is very rare that an intelligent patient is unable to detect the difference. Amenorrhœa, then, together with or followed by persistent, dark coloured uterine bleeding of moderate amount, varied by irregular metrorrhagia is almost always met with. The hæmorrhage is usually due to some separation of decidual membrane from the interior of the uterus, and is, moreover, a sign that the vitality of the pregnancy is endangered or destroyed. So long as the pregnancy—although out of place—is growing and uninjured, there is, as a rule, no uterine bleeding. External hæmorrhage, therefore, is not so much a sign of extra-uterine pregnancy as of some secondary disease or injury which has affected the pregnancy, but as the great majority of cases suffer accidental changes during the earlier months it becomes a sign of great importance. If the decidua be shed it does not follow that the bleeding ceases. Hæmorrhage continues from the interior of the uterus, while the abortive pregnancy remains as a source of irritation within the tube, and in some cases at least I have very little doubt that the hæmorrhage comes directly from the tube—the tube containing the mole of pregnancy—bleeding alike into the uterus by its open uterine end and into the pelvis by its open fimbriated end.*

We now pass to the physical signs elicited by examination of the patient :—

The signs of pregnancy afforded by the condition of the breasts—still unreliable—are yet of more importance than in the earliest stage. It is very likely that the breasts may show some increase in size and tenderness, and that a drop of watery or opalescent fluid may be easily expressed from the nipple. In some cases, too, there may be decided increase in size and pigmentation of the areolæ, but I do not remember to have ever noticed any "tubercles of Montgomery" at this period.

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* External hæmorrhage is by no means a necessary consequence of tubal pregnancy, and if extrusion of the fœtus from the tube be gradual, without rupture of the amnion, with little or no internal hæmorrhage, and if the vitality of the fœtus has been unaffected by the change, it is quite possible for amenorrhœa to persist as in normal pregnancy. This appears to have been the case in No. 33 of the appended table, the history of which is given on page 49. The same may almost be said of No. 4. In extra-uterine as well as in intra-uterine pregnancy, there is no reason to expect external hæmorrhage so long as the pregnancy is living and healthy; uterine bleeding is a sign of disturbed pregnancy in which the life of the fœtus is endangered or already lost.

Violet discoloration of the vulva and vagina is also a sign which belongs to a later date, when the pressure of the tumour above has caused local congestion. These signs of pregnancy, when present, are of considerable value as confirmatory evidence: their absence cannot be accepted as of anything like a similar value in the exclusion of pregnancy and especially of a pregnancy that may be extra-uterine.

When dealing with the pathological history of tubal pregnancy I noticed that one of the earliest and most marked phenomena attending its presence was the increased vascularity of the parts affected. There is a sign, a very constant and valuable one, accompanying this—the presence of pulsating vessels in the vaginal vault on the affected side. All the branches of the uterine artery are subject to very marked enlargement on the side of the pregnancy. It is often easy to touch a vessel the "pulse" of which is very comparable to that of the radial, and, although inflammatory affections may sometimes give rise to very similar hyperæmia, the pulsation of the vessels is rarely so marked and so easy to elicit as in tubal pregnancy.

The next point is the finding of the extra-uterine tumour. If we turn to the sequence of illustrations which I used when describing tubal mole and peri-tubal hæmatocele,* we shall at once recognise the leading features to be determined (if possible) by vaginal and bimanual examination. There is the tubal tumour caused by the misplaced pregnancy, its size, shape, position, and mobility, and there is the displacement (if any) of the pelvic viscera caused by its growth. When hæmatocele forms there may be the opportunity perhaps of following the alteration in the tumour produced by hæmorrhage—in watching the change from mobility to fixation, the rapid lateral and upward growth of the blood mass, and the change from the insensitive little tubal tumour of the healthy and unruptured pregnancy to the acutely tender and extending hæmatocele. For at first, when the pregnancy forms within the tube, there is no pain or tenderness, and it is only by accidental good fortune that the opportunity arises for an examination under these conditions. In one case, seen by me at this stage, the patient had nothing to complain of except amenorrhœa of five or six weeks' standing, but to one side and behind the uterus a little moveable tumour was plainly felt, which, by its shape and its contiguity to the uterus, suggested a tubal rather than ovarian origin. Another observer describes the tumour under these conditions as "sharply limited from the unaltered part of the tube, as closely corresponding to the size of the ovum, and as elastic but yielding" (Winter.)

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* *Vide* figures 11, 12, 13.

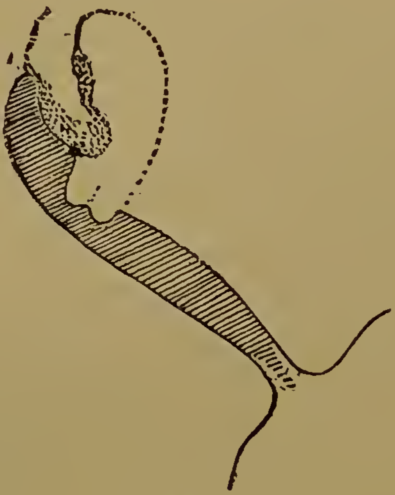

FIG. 41.

Later, if bleeding occurs within the tube its enlargement is not limited to the site of pregnancy, but the whole of the tube becomes distended, and this is the stage when the diagnosis of the tumour is attended with least difficulty. The tube is not only distended but hard, its sinuous curves are easily followed, its tubal or "sausage-shaped" character is readily ascertained, and if the hæmorrhage be limited to the interior of the tube and no blood as yet has invaded the peritoneal cavity, there is still but little or no tenderness, and a full examination may be made without difficulty or pain. The following illustration (fig. 41) will, perhaps, convey better than words can do what may be felt under such conditions by vaginal touch and bimanual examination. It also indicates the usual limitations to complete investigation. The uterus is inclined to retroflexion; its highest part can, perhaps, be felt bimanually, but whether this be fundus or the upper portion of the anterior surface is probably uncertain. Behind the cervix a sausage-like tumour is plainly felt closely applied to the back of the uterus and probably adherent to it. In some cases it seems to partially encircle the uterus like a collar. One curve of it is thoroughly felt, and above this the beginning of another is just accessible. Beyond this point any further investigation by ordinary vaginal or bimanual examination may be impossible. Rectal examination will afford larger and higher opportunities, but this is inadvisable except in cases of serious doubt and difficulty when the patient remains under the personal observation of the surgeon.

While the foregoing is a fair description of the tumour very generally found in cases of extra-uterine pregnancy it by no means follows that the tumour, or any tumour, is always met with in this situation. Sometimes the pregnant tube is altogether on one side of the uterus, the pouch of Douglas being quite empty, and when the uterus is much retroflexed the tumour may even be found in the front half of the pelvis, the pregnancy lying altogether anterior to the uterus. In this situation the tumour is very accessible to the bimanual examination provided the bladder be empty. (The use of the catheter is always an important preliminary to a thorough examination of the pelvis).

It might easily be supposed that, as hæmorrhage took place into the pelvis and the original distension of the tube was supplemented by the formation of a hæmatocele, so the resulting tumour would become increasingly prominent and more easy of diagnosis. But it is not so. With every bleeding into the peritoneal cavity there is pain, there is some collapse, and there is abdominal tenderness persisting for many days. The slightest pressure is objected to, the abdominal muscles are contracted, deep palpation is impossible, and any attempt at bimanual examination is apt to be most unsatisfactory. Furthermore, it will often be found on vaginal touch that the clearly defined outlines of the tube are obscured or even lost in the swelling of the hæmatocele. There is evidently a tumour present, and it appears to be connected with the Fallopian tube, but its upper limit cannot be palpated from the abdomen, and its exact size and boundaries are uncertain. Here the displacement of the uterus, if definite and permanent, will afford valuable evidence as to the size of the swelling which causes the displacement. A little later, if the hæmorrhage is repeated and the hæmatocele increases, we find the upper limit of the swelling appearing above the pubes. In spite of the pain and abdominal distension there is then no difficulty in ascertaining the full extent of the tumour. Above one groin we usually find the convex outline of the mass arising from below. It is lateral, fixed, tender, and bulging, and may be conveniently represented in the usual way by the accompanying outline illustration (fig. 42). The convex upper border of the mass is well marked. It is sometimes visible, it can be felt on gentle palpation, and tends to extend in an increasing curve towards the umbilicus. Below this line the percussion note is dull; above it the adherent and probably distended intestine marks a clearly defined area of resonance. This applies to the central portion of the curve; each end of it shades off into inaccessible regions—on the one side toward the loin of the affected side, on the other beneath the pubes. Examined bimanually the abdominal

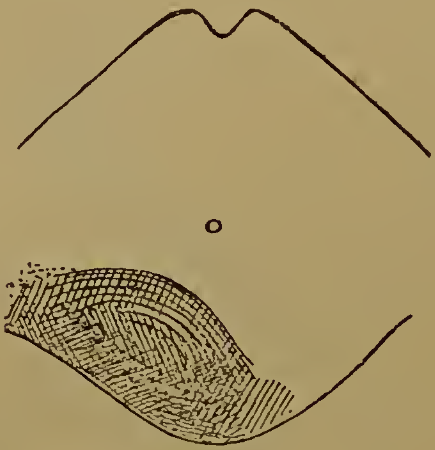

FIG. 42.

mass above the groin is felt to be one with the tubal tumour in the pelvis and the displacement of the uterus to the non-affected side (which is now extreme) is marked and unmistakable. This tumour, which is usually characteristic of the advanced development of intra-peritoneal hæmatocele, the result of bleeding from the unruptured tube, and which then is produced somewhat slowly or after repeated hæmorrhages, may also be more suddenly formed by later rupture of the tube; and, so far as physical signs are concerned, there is no essential difference in the resulting hæmatoceles. The same description will accordingly apply to both formations.

Very similar, too, is the tumour formed by an intra-ligamentary pregnancy about the fourth month when the pregnancy is of the anterior or sub-peritoneo-pelvic variety. There is no difference except that the uterus is liable to be raised as well as displaced to the opposite side by the growing pregnancy and that in this case one is more liable to meet with the signs of a fixed iliac tumour growing into the abdomen above the groin without any symptoms of internal hæmorrhage, because under these circumstances the pregnancy may be uninterrupted by accidental changes. Frequently, however, disturbances do arise and then no differential diagnosis between the two hæmatoceles is possible until the abdomen is opened.

The only other tumour needing consideration at this stage is that of the typical retro-uterine hæmatocele when the pouch of Douglas is acutely distended, its opening above into the peritoneal cavity being temporarily occluded. The condition occurs but rarely as the result of tubal bleeding (an example is afforded by Case II), but when it does take place the signs—both abdominal and pelvic—are very different from those I have already described. In the (two) cases I have seen the upper limit of the blood mass was readily felt from the abdomen, but instead of being lateral, convex, and bulging, it simply formed a hard irregular wall or line stretching right across the abdomen, midway between the pubes and the umbilicus, the abdomen below this line being uniformly hard and dull with coagulated blood (fig. 43). The active, growing, bulging pole of the tumour in this hæmatocele was transferred (as it were) from the abdominal to the pelvic aspect. The abdomen was quiescent; the pouch of Douglas was acutely distended. With one finger in the vagina and the other in the rectum the tense elastic swelling of the over filled pouch could be thoroughly appreciated, bulging between the two. The leading features of this hæmatocele are well represented in the following illus-

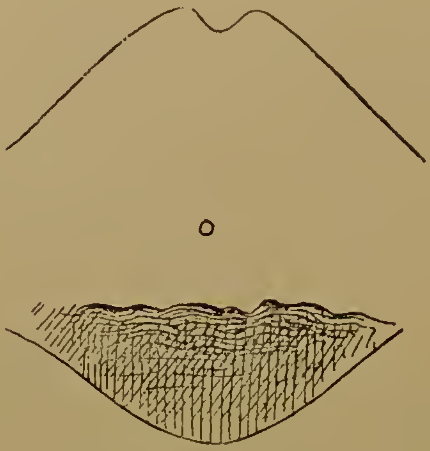

FIG. 43.

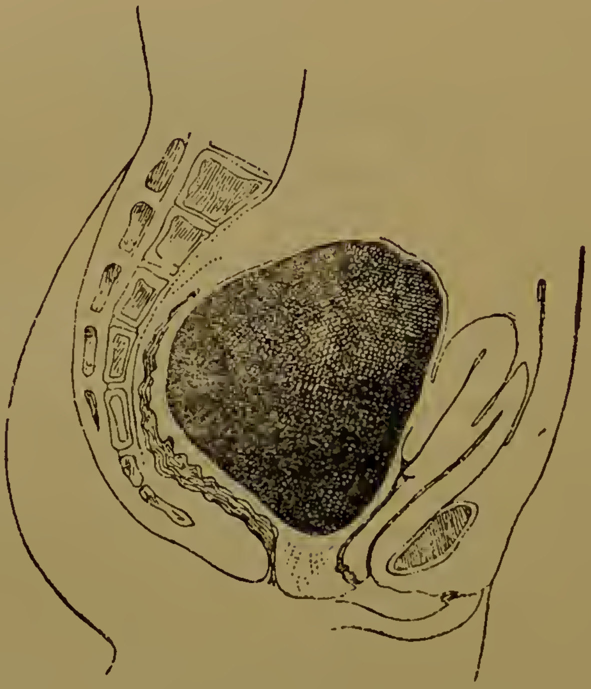

FIG. 44.

tration (fig. 44). The small intestines lie across and somewhat flatten the upper boundary of the blood mass, while the fold of peritoneum between the vagina and rectum is transformed into a large sac full of blood and serum.

The next point is the determination of the size, position, and contents (if any) of the uterus. The uterus is nearly always slightly enlarged, the enlargement bearing a strong resemblance to that of the sub-involuted uterus after confinement, and having but little in common with the broad and succulent enlargement of the pregnant organ. It is slightly thicker and longer than normal, as a bleeding uterus generally is, but the cervix is not specially soft and yielding, and the body of the uterus is rarely to be felt as a prominent tumour in front of the cervix as at the beginning of a normal pregnancy. We have already traced the early tendency of the uterus towards retroflexion and its later displacement to one side of the pelvis. Generally with the larger hæmatoceles produced by recurrent bleedings, and always in true retro-uterine hæmatocele, (which we have just been considering) the uterus is strongly displaced forwards. When the pouch of Douglas is excessively distended, it may also be carried upwards so that the cervix is difficult to reach. The exact position of the fundus and the emptiness or non-pregnant state of its cavity are very important, and sometimes very difficult points to determine, but they must be decisively settled before any operation is undertaken.

Sometimes the differentiation between an extra-uterine tumour or an enlargement of the uterus itself is very much assisted by the following method of examination :—

First, the "portio vaginalis" of the cervix is thoroughly explored by vaginal touch and then the examining finger is carried upwards into the pelvis along the side of the cervix, stretching the vaginal roof and following up the cervix (at the most accessible part) as high as the finger can reach. In this way the lower part of the tumour is explored by the finger while the latter still retains the apposition and guidance of the uterus. If the tumour be extra-uterine, though in close contact with the uterus, the latter may be easily felt as a finger-like thickening fixed to one part of the tumour wall.

Secondly, the knowledge gained by vaginal touch is confirmed and extended by the combined or bimanual examination :—

The disengaged hand is placed lightly on the lower part of the patient's abdomen, and the uterus having been explored from below and its direction clearly ascertained, the probable situation of the fundus—toward the front or the side of the pelvis—is definitely determined. Then, if the hand on the outside of the abdomen be carried to this point, the fingers of the outside hand may often be gently pressed down on the summit of the fundus in spite of the larger displacing tumour of the pregnancy, and the whole of the uterus may be accurately mapped out (bimanually) by the fingers. Sometimes the conditions—the co-existence of peritonitis and abdominal distension—make such examination an utter impossibility, and then it may not only be allowable, but necessary, to pass the uterine sound in order to come to a certain conclusion. Both the passage of the sound and rectal examination should, however, be left to the discretion and use of the operating surgeon. All other reasonable methods for determining the condition of the uterus should have been previously used, and the same delicate gauging of the probable position of the fundus and direction of its

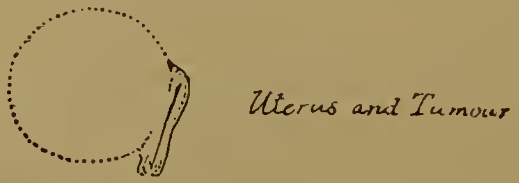

FIG. 45.—The tumour and the uterus in close relation.

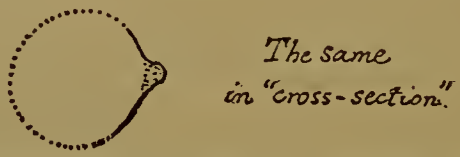

FIG. 46.—The tumour and the uterus in cross section.

cavity as that already described should precede the final determination of the curve of the sound and of the passage of its tip within the external os.

We have now concluded the examination of the patient, but we have still to consider the symptoms which accompany intra-peritoneal bleeding and hæmatocele. Some have been incidentally referred to, such as abdominal pain and tenderness, distension, and rigidity of the abdominal muscles. The characteristic feature of these symptoms, as also of the collapse and faintness and vomiting generally accompanying them, is that they come on suddenly because they are directly due to the bleeding, and if the bleeding be slight or moderate they rather quickly diminish in intensity or entirely disappear. For instance, a patient suffering in this way may feel perfectly well all day, be attacked with sudden violent pain at 11 p m., feel seriously ill for half the night, have a good sleep towards morning, and be attending to her usual household duties in the course of the following day. These attacks, in the same way as the bleeding which we have studied before, are almost inevitably recurrent, so that in a large number of cases treated by operation, we have a clear history of three or four attacks before the abdomen is opened. The suddenness of these attacks is very frequently surprising to the patient herself. One of my patients, in whom they occurred during the daytime, gave a history of a fall with each attack, evidently supposing that the pain from which she suffered was the consequence rather than the cause of the fall in each case. Some of the remarks of the patients are as follows:—"I was suddenly seized with pain on the left side of the belly, in the back, and in the thigh. I was bent double with it." "I was seized with sudden pain in the lower part of the stomach soon after getting out of bed." "I was seized with sudden pain three weeks ago on returning from church on Sunday, violent abdominal pain and vomiting being my chief symptoms. The pain was repeated on the following Thursday and Saturday and twice during last week." Vomiting very generally accompanies the attacks, but is not persistent. At first the patient usually speaks of the pain as being all over the abdomen, but when questioned can generally differentiate one side as being more painful than the other. If the bleeding increases, and always if the hæmatocele extends beyond the groin into the abdomen or really fills and distends the pouch of Douglas, the condition of the patient becomes permanently serious—she is confined to her bed with abdominal pain and tenderness. She is, as a rule, visibly anæmic from the loss of blood ; there is either present or there is the clear history of some acute peritonitis following the last attack. The pulse is quick and feeble—probably 120 or more. There may be considerable pyrexia, the temperature rising to from 100° to 103° F., and in a certain proportion of cases there is slight but decided albuminuria. This last symptom appears in some way to be directly due to the blood effusion, for in the cases in which I have observed it, it has promptly disappeared after operation. The pyrexia in intra-abdominal hæmatocele is probably due to re-absorption of blood, and need not be regarded as septic. When, however, the peritoneum has been lifted from the rectum, or the pouch of Douglas is shut off from the rest of the peritoneal cavity, and this is acutely distended with blood, septic changes may occur and the pyrexia then is of a different character. The proximity of the rectum, the anterior coat of which is stretched and thin or the serous covering of which may be defective, favours the passage of septic matter from the bowel into the hæmatocele ; decomposition of the blood slowly occurs, and the temperature may gradually rise to 104° or 105° F. The iliac hæmatocele or the pouch of Douglas becomes further distended by inflammatory effusion, and all the symptoms of septic absorption are present. Apart from this condition the chief value of the symptoms is as a measure of the importance and severity of the internal bleeding. The anæmia, the faintness, the collapse, the vomiting, the abdominal pain, and the peritonitis will vary in direct ratio to the bleeding. If such symptoms are produced slowly they point to tubal mole with increasing hæmorrhage from the unruptured tube. If, on the other hand, they are produced suddenly they point to later rupture of the tube.

With this we complete the consideration of all the elements which go to form a positive diagnosis of extra-uterine pregnancy, before and during those disturbances to its progress which are so common in the earlier months—the disturbance of intra-peritoneal bleeding and hæmatocele formation. Let us briefly recapitulate them. We have—

1. A patient within the child-bearing limits of age, and one in whom a pregnancy is possible.

2. She has recently been in good health.

3. It is more likely than not that several years have passed since her last pregnancy.

4. There is a history of some amenorrhœa accompanied or followed by—

5. Irregular uterine hæmorrhage, occasionally profuse and red, but generally dark in colour, moderate in amount, and persistent in its course.

6. With this there may be the history of the passage of some membrane, either in one pouch or bag as a "complete decidua," or in two pieces, or in shreds.

7. The breast signs may confirm the suspicion of pregnancy.

8. On examination, pulsating vessels may be felt in the vaginal vault on one side of the uterus.

9. On this side also, and closely investing the back of the uterus, there is nearly always a tubal tumour (exceptionally this may have a different or curious situation).

10. This tumour enlarges markedly and suddenly by recurrent hæmorrhages and by the formation of a hæmatocele directly continuous with the original tubal tumour.

11. These hæmorrhages are signalised by sudden spasms of severe abdominal pain and by transient attacks of peritonitis.

12. They are accompanied or followed by commensurate *anæmia* which, after repeated attacks, may be severe and marked.

13. The uterus is displaced by the hæmatocele at first

backwards, afterwards to the opposite side of the pelvis, and sometimes forward (against the pubes) (it is very rarely that the uterus is permanently displaced downwards); and

14. The uterus throughout, although slightly enlarged, may be proved to be empty.

The differential diagnosis still remains for us to consider. Extra-uterine pregnancy under the conditions I have been describing may be simulated by, or mistaken for:—

1. Simple abortion.
2. Intra-uterine pregnancy complicated with pelvic tumour.
3. Retroflexion of the gravid uterus.
4. Anteflexion of the gravid uterus.
5. Pyosalpinx.
6. Myoma.
7. Twisted pedicle tumours:—
    - (*a*) Of the tube.
    - (*b*) Of the ovary.

1. Simple abortion:—

Simple abortion may occasionally be mistaken for an extra-uterine pregnancy, but the more important difficulty is that when a case of extra-uterine pregnancy is mistaken for one of incomplete abortion. I have met with both mistakes in the course of practice. The history and symptoms of the two affections are very similar. In both there may be a period of amenorrhœa recognised by the patient as probably due to pregnancy, and the breast signs and a history of morning nausea may be confirmatory of this opinion. The amenorrhœa may be followed by irregular bleeding, by the passage of membranous clots (which have not been preserved), and at the time of seeing the patient the abdominal pain and tenderness may be so acute as to excite the suspicion of peritonitis—the painful uterine cramps of the aborting uterus and the shock produced by these, closely simulating the peritonitic pains and collapse caused by internal bleeding.

The physical signs, however, are altogether different, and a careful bimanual examination (with the bladder empty) is usually quite sufficient to make the diagnosis certain.

Mrs. K., aged 23, married 4 years, having had two children and two miscarriages (the last of these nine months previously) was admitted into the hospital on the morning of February 17th, at the urgent request of her medical attendant who suspected a tubal pregnancy. Her last menstrual period was on November 4th. This was followed by two months' amenorrhœa, and this again succeeded by persistent irregular hæmorrhage which lasted over six weeks. Four days before admission acute abdominal pains were complained of, and these increased in severity causing considerable alarm on the night of the 16th. I saw the patient directly after admission on the morning of the 17th, and although the cervix was small and undilated it was not difficult to ascertain that the tumour of pregnancy was central, that it was continuous with the cervix, that no uterine body could be felt apart from the tumour, and that the back and sides of the (uterine) tumour were free from any abnormal swelling. The abortion took place at 9 p.m. of the same day.

When an incomplete abortion is simulated by a real extra-uterine pregnancy there is, as a rule, some unusual situation of the tumour, or else some difficulty—such as extreme abdominal tenderness or rigidity, or a very loaded condition of the rectum—which prevents a complete examination of the pelvis. As we have seen, it is on a thorough bimanual examination, and on this alone, that we must rely for a differential diagnosis. Accordingly when the conditions are unfavourable for full examination, or when there are any grounds for supposing that an extra-uterine tumour may be present but inaccessible, great caution is needed. The interference that would be right in incomplete abortion may be very harmful when the main source of irritation is outside the uterus. No. 36 is a case in point.*

Mrs. L. came to my out-patient room at the hospital with all the symptoms of an early abortion, and at her first visit I could find no trace of any tumour, the abdomen being rigid and the conditions generally unfavourable for full examination. The uterus was enlarged, the cervix was soft and open, and the hæmorrhage had been continuous for four weeks. Diagnosis was deferred. Some few days afterwards the uterus was dilated by the physician in attendance at the patient's home. Nothing was found within it. Severe abdominal pain set in coincidently with the dilatation. I saw the patient again, recognised a tubal pregnancy on the right side of the uterus, admitted her into the hospital, and operated. The tube was ruptured, the placenta protruding. There were also recent inflammatory adhesions about the tube and uterus.

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* Another example is perhaps afforded by Dr. Braxton Hicks' case referred to on page 125. Dilatation and examination of the uterus was followed by vomiting, increasing distension of the abdomen and (about a week afterwards) by sudden collapse.

2. Intra-uterine pregnancy complicated with pelvic tumour:—

The simulation of an extra-uterine pregnancy by a normal pregnancy, when this is complicated by the co-existence of some uterine or extra-uterine pelvic tumour, may be exceedingly close, and although intra-uterine exploration would at once decide the question this may be altogether or temporarily inadmissible. In this case, so long as no urgent symptoms are present, diagnosis may be rightly deferred until a second or third examination, when the alteration produced by the continued growth of the pregnancy may prove an important factor in deciding the site of the (growing) pregnancy.

Mrs. M., who has two children, the youngest of whom is twelve years old, came to me on October 6th, 1898, having missed two periods. Severe abdominal pain on the right side had been complained of ever since the cessation of the menses. On examination bimanually I found a globular tumour to the right of the uterus displacing the latter to the left. Both tumour and uterus felt soft and elastic, and the symptoms, history, and indications afforded by the breasts, all pointed to the existence of a pregnancy. It appeared to be impossible to decide whether this was interstitial or tubal (close to the uterine extremity of the tube), or intra-uterine complicated by some uterine or broad ligament tumour, and there was absolutely nothing in the history or symptoms to point to any discomfort or abnormality before the beginning of the pregnancy. I watched the case carefully for more than two weeks, and then was able to satisfy myself that the uterus itself was enlarging while the swelling on the right was stationary. The pregnancy was therefore intra-uterine.

Later on, I had the opportunity, after abdominal section, of proving that the tumour of the right side was a large "sessile" myoma growing from the right side of the uterus.

3. Retroflexion of the gravid uterus:—

Retroflexion of the gravid uterus has been recognised by most authors as a condition needing careful differentiation from extra-uterine pregnancy, because unfortunate cases have been recorded in which a distended tube in Douglas's pouch has been supposed to be the pregnant retroverted fundus, and an injudicious attempt at its replacement (?) has ruptured the tubal sac and hastened the death of the patient. When one knows this and recognises the danger of any interference before a certain diagnosis is formed it will be found excessively rare or impossible for any similar mistake to recur. At the same time the superficial striking similarity between the tumour of a retro-uterine ligamentary pregnancy or a retro-uterine peri-tubal hæmatocele and that of a gravid retroflexion, and the almost involuntary diagnosis of the latter which may automatically follow a vaginal examination, quite justifies the following advice:—*Never to diagnose a gravid retroflexion without careful exclusion of extra-uterine pregnancy.*

The following case (No. 41) may be taken as illustrative of this difficulty in the earlier stage of extra-uterine pregnancy.

Mrs. N., aged 38, having had nine children, the youngest of whom is four years old, was sent to the Hospital with the following history:—Her periods had been quite regular until five weeks ago; then she had irregular hæmorrhage for two weeks, followed by acute abdominal pains; again for two weeks she was free from discharge, and after this, for a week before admission, there had been some return of the hæmorrhage. The abdominal pain continued but was intermittent. For three weeks there had been considerable difficulty in passing urine, but no complete retention. On examination the cervix was found to be large, soft and open; it was directed forwards and pushed upwards behind the pubes. Following the cervix backwards with the finger it appeared to pass directly into a large elastic tumour filling the pouch of Douglas. This felt exactly like a retroflexed and pregnant fundus. Very little could be elicited by abdominal palpation, but after the bladder had been emptied by the catheter some substance could be felt on bimanual examination in front of the elastic tumour filling the pouch of Douglas, and this was regarded as in all probability the body of the uterus. Then (but not until then) a sound was passed, previously bent to suit the probable direction of the uterine canal, and the position of the fundus was proved to be anterior to the tumour.

On the following day, before operation—when a tubal pregnancy was removed by posterior vaginal section—another examination was made under anæsthesia. The aid afforded by the anæsthetic was very marked, and the uterus and tumour could be well mapped out as in the accompanying figure (fig. 47).

In this case the main misleading elements were the condition and direction of the cervix, these being quite consistent with the theory of a pregnant retroflexion.

Usually when a retro-uterine tumour is completely filling the pelvis, the uterus—quite straight—is flattened against the pubes and lower abdominal wall; the cervix is pointing directly downwards and the fundus may be sought for as a prominence or ridge immediately above the pubes.

At a later period—both in a retro-uterine pregnancy and in retroversion of the gravid uterus—the condition may become still more unintelligible on simple vaginal examination owing to the complete disappearance of the cervix. In a case of retro-uterine tumour, however, the uterus must be somewhere in front of the tumour and as the tumour enlarges, the uterus should become more and more accessible to abdominal palpation. If there is good reason to believe that the uterus is in front of the tumour and *not* pregnant, the diagnosis may sometimes be confirmed by the careful passage of the sound even when the cervix is beyond the reach of the finger. In one way or another the position of the fundus must be ascertained; its presence or its absence in front of the tumour must be satisfactorily determined. When the pregnant fundus is in the pouch of Douglas there is of course no fundus to be felt in front of the tumour. Bimanually the fingers of both hands may, perhaps, be so closely approximated above the pubes that the cervix may be felt to be continuous with the posterior tumour and absolutely free from any other con-

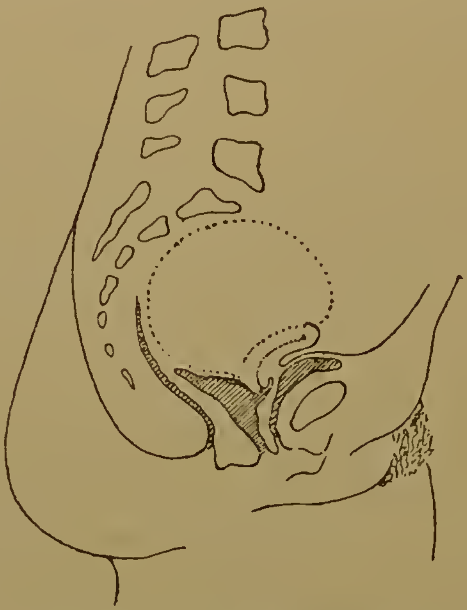

FIG. 47.—Diagram of retro-uterine tubal pregnancy and peri-tubal hæmatocele simulating a gravid retroversion.

nexion. Retention of urine is more common in retroflexion of the gravid uterus while a discharge of blood (unattended with labour pains) is more common in extra-uterine pregnancy.

4. Anteflexion of the gravid uterus:—

Anteflexion of the gravid uterus, although but rarely recognised as a possible source of error, may occasionally be quite as perplexing as the gravid retroflexion. Whether from an unusually high attachment of the impregnated ovum—quite at the fundus uteri—or from some other cause less easy to understand, a pregnant patient, usually a primipara, is sometimes found who suffers from severe pains during the early months of pregnancy and in whom the two or three months pregnant fundus forms a globular elastic tumour which appears to have little or no real continuity with the cervix (fig. 48). The cervix remains thin, hard, undeveloped, pencil-like, and runs behind the tumour of the pregnancy as far as the finger can reach. Further, it is absolutely lengthened, so that it feels as if the whole of an infantile or ill-developed uterus was to be explored behind a sac of pregnancy. I have even known a sound, when passed to the top of the lengthened but undeveloped cervix under these conditions, give almost or quite the normal uterine measurement, produce no abortion, and in this way afford to the practitioner who used it, confirmation of his (mistaken) opinion that the pregnancy was outside the uterus. Again, the knowledge that such cases occur is the surest safeguard against error. Sometimes the round ligament

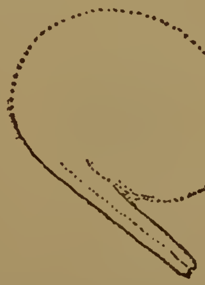

FIG. 48.—Diagram of anteflexed pregnant uterus with lengthened but undeveloped cervix.

can be felt on each side of the distended fundus, and if so it is certain that the tumour felt is the uterus itself. If serious doubt remains in spite of ordinary careful methods of examination (which should *not* include the passage of the sound) it may be a relief to remember that extra-uterine pregnancy as well as intra-uterine pregnancy in a malformed uterus does not as a rule cause urgent danger or need immediate interference so long as there is no sign of uterine discharge. If the patient be kept in bed she may remain under observation until the condition becomes clearer, or until a more experienced opinion can be obtained.

5. Pyosalpinx :—

Double pyosalpinx may simulate a tubal pregnancy very closely. Pyosalpinx is usually accompanied by regular menstruation, menorrhagia, or metrorrhagia. Every now and then, however, in double pyosalpinx (when the ovaries have probably been rendered temporarily functionless by dense enveloping adhesions) there is total amenorrhœa of from two to three or four months' standing, and then the symptoms and signs may be almost identical with those of tubal pregnancy. The pyosalpinx will form a typical tubal tumour, and when both sides are affected the tube of the one side is nearly always very much more distended than that of the other, so that the main tumour is one-sided. The inflammatory thickening and adhesions closely surrounding the tube may simulate a hæmatocele. A pinhole perforation of the distended tube may cause abdominal pain, collapse, vomiting, and a consequent attack of peritonitis, and in short there may be nothing but the history to guide us to a wise and correct diagnosis. Here the immediately preceding health or ill-health of the patient becomes a point of high importance. If the pyosalpinx be quite recent there will still be the history of purulent vaginal discharge preceding the pelvic inflammation, while if, as is more probable, the pyosalpinx be an acute recrudescence of an old affection, the patient may confess to some similar attack two, three, or four years previously, and to some tenderness or aching in one side during all these years.

6. Myoma :—

An uncomplicated myoma of the uterus is very rarely mistaken for anything else, but a tubal pregnancy may be mistaken for myoma. The likeness to myoma is most marked when a tubal or peri-tubal hæmatocele, not of very recent formation and hard from coagulation of the blood contained in it, is firmly fixed on one side of the uterus and is free from all other connexions. Then if the observer's mind be fixed on the condition of the uterus as a cause for continued uterine hæmorrhage, and if on bimanual examination he can thoroughly palpate a globular immovable "boss"—not specially tender—on one side of the fundus uteri, he may easily imagine the case to be a clear one of myoma. Case No. 37 may be taken as an example.

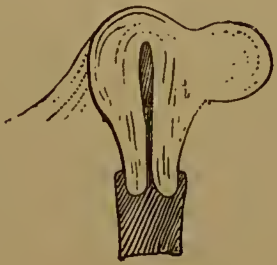

FIG. 49.—Diagrammatic representation of uterus and tumour as felt in Case 37.

Mrs. O. was sent to me as suffering from cancer of the uterus causing continued uterine hæmorrhage. The cervix was badly lacerated and diseased, but no certain sign of cancer could be detected. On further examination a hard tumour or out-growth was felt extending from the fundus. It moved with the uterus and had no other connexions.

Here was the source of the bleeding. Yes; but not the source imagined. Instead of the myoma too hastily diagnosed the tumour was a peri-tubal hæmatocele around an early tubal pregnancy. A more careful attention to the history would have prevented this error and, when extra-uterine pregnancy is present, would generally direct the thoughts into a right channel. In the present instance there was a history of acute abdominal pain corresponding to the formation of the hæmatocele, and any attack of this kind is unknown or very unusual in myoma.

7. Twisted pedicle tumours :—
   - (*a*) Blood tumours of the tube from twisted pedicle.
   - (*b*) Blood tumours of the ovary from twisted pedicle.

Small tumours of the tube or ovary arising from or increased after twisting of the pedicle are very liable to be mistaken for misplaced pregnancies which have resulted in internal hæmorrhage. Not only are the signs and symptoms extremely similar, but the physical condition, the resulting hæmatoma or hæmatocele, may be almost alike in the two conditions. When accompanied, as they sometimes are, with menstrual irregularity, the history also may favour the suspicion of a tubal pregnancy with hæmatocele. The sudden abdominal pain which characterises the final twist when the return circulation is obstructed, the vomiting and faintness which accompany this, and the rapid formation of a prominent and tender tumour, are all suggestive. The tumour itself, however, is not so intimately connected with the uterus as a tubal pregnancy would be. Whether formed by the tube or the ovary it has rather the character of an ovarian enlargement, and unless adherent to the uterus there is quite generally some unoccupied space to be discovered between the uterus and the tumour. The following cases are illustrative :—

Mrs. P., aged twenty-nine years, had been suckling her second child for six months, when she was suddenly seized with severe abdominal pain on the left side. The pain continued. When examined some days later, the following note was made : " A soft (cystic) elongated body, probably tubal, is felt behind the uterus." The patient had not menstruated since her confinement. The case was watched for a time and before operation the diagnosis was entered of " adherent tumour of the left ovary and tube." Abdominal section showed a torsion blood-cyst of the left Fallopian tube.

Mrs. Q., aged thirty-seven years, menstruated regularly until six weeks ago. On March 24th (five weeks after her last menstruation) she was suddenly seized with severe abdominal pain, fainting, and sickness. This occurred at night, and the pain has continued ever since. On examination a globular, tender tumour of about the size of a child's head was felt above the pubes on the right side. The uterus was displaced to the left by the tumour ; it was of normal size and appeared to be empty. Although displaced by the tumour, no direct connection could be made out between the uterus and the tumour. The alternative diagnosis was made of right ovarian tumour with twisted pedicle, or extra-uterine pregnancy in the right Fallopian tube with hæmatocele. Abdominal section showed a black adherent blood tumour of the right ovary with a three times twisted pedicle.

CHAPTER XII.

DIAGNOSIS (*continued*).

(2). OF GROWING, FULL TERM AND DEAD PREGNANCIES: (TUBAL, TUBO-ABDOMINAL AND TUBO-LIGAMENTARY) AND OF TUBO-UTERINE OR INTERSTITIAL PREGNANCY.

So far we have been considering the diagnosis of extra-uterine pregnancy as associated with various disturbing influences which usually destroy the life of the fœtus and seriously threaten or destroy that of the mother also.

Common as these disturbances are in the earlier history of a tubal pregnancy—so common that the diagnosis, as we have seen, may be largely based on the phenomena occasioned by their presence—it is yet well to remember that these disturbances are rather accidental than essential.

The living, growing, extra-uterine pregnancy, though it usually passes through some phase of disturbance when it leaves the confines of the tube or uterus—either quickly recovers from the local hæmorrhage occasioned by the extrusion of the fœtal sac, or invades the abdomen or broad ligament with but little or no hæmorrhage, either internal or external.

Accordingly, the diagnosis after invasion and sometimes throughout the whole of the pregnancy, is to be made almost entirely from consideration of:—

(1). The signs of pregnancy, general and local.

(2). The presence and characters of the extra-uterine tumour; and

(3). The pain occasioned by the misplaced pregnancy.

It is but rarely that any opportunity arises for close observation of a growing pregnancy through all the months of extra-uterine development, and the records of any extended observations are exceedingly limited.

The best method open to us will be to take one or two pictures of cases at different stages of development, and after the consideration of these to deal with the subject of diagnosis generally.

Perhaps it will be well to begin with the description of a tubal pregnancy of nearly four months' growth, which attained considerable size as an abdominal tumour without any rupture of the tube or internal hæmorrhage, and which has been exceedingly well recorded by Dr. Howard A. Kelly of Baltimore.

"Mrs. R. was twenty-two years old and had been married for three years. She had had one premature still-birth and one child eleven months before I saw her. She came to me early in December, 1885, stating that her menstruation had been regular up to July, but that she had not menstruated from July until the middle of November, when she discharged something like a piece of flesh. In October she had noticed a painful swelling low down on the right side" (of the abdomen?), "the pain was severe and continuous until the menstrual flow came on and relieved it.

"Upon examination, I found a little milk in the flaccid breasts, and a smooth, tense, elastic, ovoid tumour, filling the right side of the pelvis anterior to the cervix, which was displaced back into the sacral hollow. The tumour was felt in close contact with the whole anterior vaginal wall; it was moderately movable and its posterior pole lay close to the right uterine cornu and felt as if pivoted there. It filled the lower abdomen on the right side, half way up to the umbilicus, and gave a peculiar, tense, elastic sensation on pressure. The uterus was small and retroposed, reclining in the sacral hollow.

"At her next visit she said she thought she must be pregnant as she had felt slight movements.

"On December 16th, a month after the discharge of the decidua, she had a slight flow without any pain, and on the 12th of January she had a free discharge, lighter in colour than normal menstruation, and again on the 8th of March she had a free flow lasting until the 13th. The following note was made on this date:—'Uterus small, low down in the hollow of the sacrum. By palpation through the anterior vaginal wall an ovoid tense cyst is felt on the right side, about 12 cm. in length by 7 cm. in breadth. The axis of the cyst lies in the plane of the superior strait; its anterior extremity lies at the symphysis pubis to the right, while its posterior extremity is at the right cornu uteri. A well defined sulcus lies between the tumour and uterus, which are connected by a short but easily recognisable pedicle. The tumour is very sensitive to pressure. It is very smooth and has a remarkable elastic feeling like a rubber ball; there is much tenderness on the left side, low down, where there is an indistinct worm-like feeling about the retroposed cornu uteri.'

"The tumour when first seen had extended out of the pelvis half way up to the umbilicus, and had, therefore, markedly diminished in size while under observation."

The operation, performed March 20th, 1886, revealed a right-sided unruptured extra-uterine sac, 10½ cm. long, developed in about the middle of the uterine (Fallopian) tube. ("Operative Gynæcology," 1898, vol. ii., pp. 445, 446).

It will be noticed that the tumour of the pregnancy in its unruptured sac is recorded as being "smooth, tense, elastic, and ovoid." "Tenderness" is not recorded as a characteristic until after the death of the fœtus. Another phenomenon generally associated with—or rather following—the death of the fœtus is brought before our notice as a diagnostic sign, and may (intercurrently) claim some attention. This is the diminution of the liquor amnii and the consequent *shrinking of the sac,* a phenomenon which will be further considered in the Chapter on the Retained Fœtus.

The next case chosen for illustration is a tubo-abdominal pregnancy of about six months' growth, complicated with some prolapse of the uterus. This was recorded nearly twenty years ago by Dr. Braxton Hicks, and the record, although not quite complete in all details, shews indications of closer observation than can be found in many others of later date.

The patient was a married woman, 29 years of age, who had had two children with natural labours, one, seven years before, the other four years; no miscarriages.

On examination Dr. Braxton Hicks writes:—

"I found a tense enlargement extending on the right side (of the abdomen), three inches from the median line up as high as the umbilicus, whence it rose nearly to the left ribs, towards the flank, and extended downwards, filling the whole left hypogastric region, not unlike the form of an enlarged spleen. It was dull throughout. However, it was plain immediately upon examination that a living fœtus existed within, more easily felt at the upper part than below. The movements I have been able to place on permanent record by the means of tracings taken by an instrument like the cardiograph. A so-called "placental bruit" was heard over the centre of the abdomen, below the umbilicus (fig. 50). The fixed condition of the lower part, as well as the oblique form, showed me that the case was abnormal. This was more apparent by vaginal examination. I found the os and cervix and the posterior vaginal wall large, protruding through the vulva, the external os patulous, so that the finger could reach the internal os which was closed. The parts about the roof of the vagina were all consolidated together, and no movement of the various parts was possible; besides, it was difficult to make out the uterine body. Suspecting extra-uterine fœtation, I carefully passed the sound into the uterus, and could not carry it up beyond the unimpregnated length. To make doubly sure, I had a sponge tent introduced; nothing was found within but some fragments of developed decidua." ("Obst. Trans.," vol. xxii., p. 142).

Here we have still a smooth, tense, elastic and ovoid tumour, not central but laterally or obliquely placed, and it is now differentiable into two parts; an upper one where the movements of the fœtus are very plainly to be felt and seen, and a lower one over which the placental bruit is audible. The fact of pregnancy is easily ascertained "immediately upon examination." Tracings of fœtal movements are easily taken and therefore must have been marked and very perceptible, and the abnormal position of the pregnancy is rendered more apparent on bimanual examination.

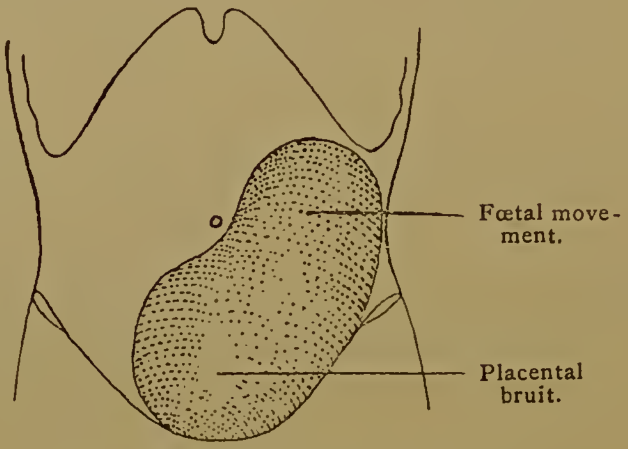

FIG. 50.—After Dr. Braxton Hicks.

As examples of living tubo-abdominal pregnancies at full term, I will take the clinical records of a case of my own (No. 3), the case of Mr. Jessop recorded in the "Obstetrical Transactions" of 1876, vol. xviii., p. 263, and a case of Dr. Stevenson of Rondebosch, Cape Colony, communicated by Dr. Playfair to the Obstetrical Society in 1892 (vol. xxxv., p. 175).

My own case ("Obst. Trans." vol. xxxiii., p. 117), is as follows:—

"Mrs. S. is 35 years of age and has four children, the youngest being eleven. She menstruated regularly until the beginning of October, 1889, which was the time, or about the time, of the last normal menstruation, and she then missed a period. This was followed for some time by irregular hæmorrhage and pain for which she was attended by Dr. Lycett at the end of December, 1889, and the beginning of January, 1890. She has had occasional abdominal pain since this date but not such as to need medical advice until the last few days when the pain has been severe.

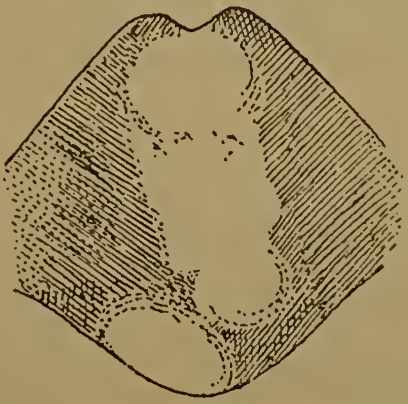

FIG. 51.—External configuration of abdomen in Case 3.

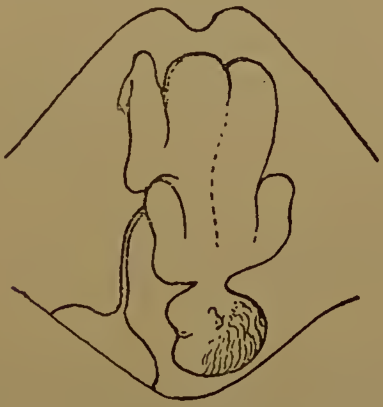

FIG. 52.—(Movable) position of child as found at operation.

"On examination the abdomen is seen to be greatly enlarged, the enlargement being almost confined to the left half of the abdomen. By palpation the outline of a full-sized fœtus can be plainly distinguished through the abdominal walls, its head lying lowest, above the left groin, while the breech and legs can be felt, although not so plainly, just below the ensiform cartilage and the costal cartilages of the left side. Over the thorax of the child the pulsation of the fœtal heart can be distinctly heard. To the right side of the fœtal head and slightly lower in position is a large globular mass which is probably placenta. (The fœtus can be rather freely moved across the middle line and made to take up an almost central situation). Per vaginam, the cervix is found to be widely open, the uterus is not much enlarged, the sound only passing two and a half inches. The lowest portion of the swelling (placenta ?) is to be felt behind the uterus."

(At the operation, which was successful for both mother and child, the position of the fœtus and placenta was found to be exactly as diagnosed).

The record of Mr. Jessop's case is taken from the "Obstetrical Transactions," for 1876.

Mrs. T. was 26 years of age, and had one child five years old. From the the beginning of January, 1875, her menstruation ceased, and towards the middle of May she began to feel the movements of the child. On the 13th of August the pregnancy was discovered to be extra-uterine and she was admitted to the Leeds Infirmary.

Mr. Jessop writes:—"The abdomen was throughout distended. At the umbilicus and below was a large rounded prominence, which gradually sloped off towards the ensiform cartilage, and terminated inferiorly somewhat abruptly in a hollow, which was bounded again by a lesser prominence immediately above the pubes. On a closer examination the umbilical prominence presented the characters of a child's breech; the cleft and the two buttocks were distinctly traceable through the thin abdominal walls, and extending upwards in a straight line towards the sternum the little prominences of the vertebral spinal processes were plainly perceptible. Above the pubes two feet could be made out, and above the umbilicus, immediately below the ribs, it was not difficult to map out the outlines of the two scapulæ. The rapid beating of the fœtal heart could be most distinctly heard towards the right side above the umbilicus. The breasts were enlarged and the areolæ were fairly developed.

"On examination, per vaginam, the uterus felt somewhat enlarged, and on measurement by Simpson's sound its cavity was found to be 2½ inches in length. The uterus remained motionless, whilst the abdominal contents were swayed from side to side. On several occasions the movements of the child were plainly visible and indicated considerable vigour. After repeated careful search we were unable to satisfy ourselves of the presence of a placental souffle."

At the operation "on incision of the abdomen the breech and back of the child came directly into view, its breech was presenting towards the mother's navel, its head folded upon the chest was buried beneath the omentum and transverse colon; the soles of its feet were pointing towards the pubes and its knees were resting upon the posterior brim of the pelvis" (fig. 53).

(The operation, as is well known, was successful for both mother and child).

Dr. Stevenson's case is as follows:—

"Mrs. U., aged 40, married 17 years, never pregnant before, has always been in good health until lately when she has had pains across the abdomen and vomiting. She had no pain up to the eighth month of gestation.

"External examination:—Abdomen very distended, full up to the ribs, on percussion, a fluid wave is felt all over. Right across the umbilicus, stretching from right to left, the body of a fœtus is felt, the head to the left, the feet to the right. The fœtal heart can be heard about the umbilicus and the body floats freely in fluid; above the symphysis pubis a hard round body is felt the size of two fists (placenta ?), and nowhere can the placental souffle be heard. Per vaginam, the os points forward, the cervix is soft, there is no bulging in any of the culs-de-sac, and no discharge. A sound passed in utero shews that organ to be empty."

(On opening the abdomen, after the death of the patient, the fœtus was found within the abdominal cavity in the position described, and enclosed in a very thin cyst containing offensive fluid. The placenta was attached to the uterine fundus. The broad ligaments were normal in appearance).

These three cases may be taken, I think, as fairly representative examples of living tubo-abdominal pregnancy at term; representing, as they do, a head, a breech, and a transverse "presentation" in operative tubo-abdominal delivery. From the consideration of these and of very similar cases to be found in gynæcological literature, we may conclude that in most cases of tubo-abdominal pregnancy that have advanced towards term:—

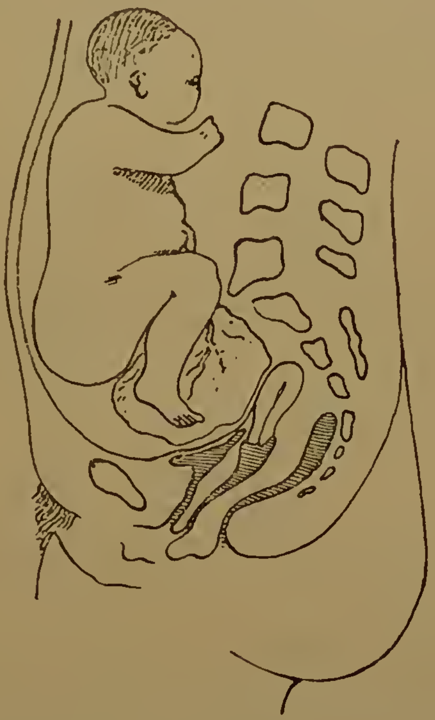

FIG. 53.—To illustrate Mr. Jessop's case.

(1). There is no doubt of pregnancy.

(2). The abdomen is distended unequally.

(3). The amount of liquor amnii is very variable.

(4). The fœtus can be easily palpated.

(5). The fœtal movements are marked and sometimes very painful.

(6). The pulsations of the fœtal heart are easily heard.

(7). The placental souffle or bruit is often inaudible or only heard with difficulty.

(8). The uterus is but very little or not appreciably enlarged—the uterine sound usually passing only 2½ inches.

When the child is living, the ordinary history, symptoms, and external signs of pregnancy are probably present. There is a history of amenorrhœa, corresponding to the period of pregnancy, with or without some history of transient pain and discharge about the time when the fœtus escaped beyond the limits of the tube. The patient herself has possibly passed through the troubles and sensations generally incidental to a normal pregnancy—the morning sickness, unusual cravings of appetite, and the period of quickening. The mammary signs, pigmentation of the areola and follicular development round the nipple (never very reliable), are more likely to be present than wanting. There is turgescence and bluish discoloration of the vulva and vagina. The mother is usually very conscious of the movements of the child and if she have experience of former (normal) pregnancies may perhaps complain of their unusual position or character. The pain from the fœtal

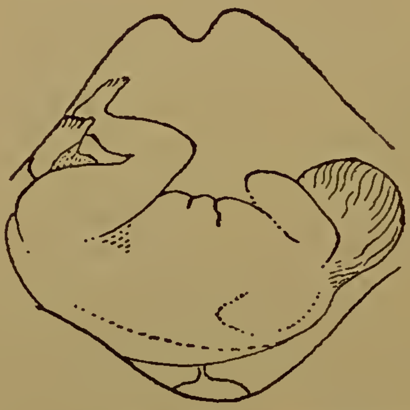

FIG. 54.—To illustrate Dr. Stevenson's case.

movements increases very remarkably during the last fortnight of gestation.

On examining the abdomen the fœtus is immediately recognised, sometimes on simple inspection, and always on light palpation.

The fœtus and placenta are probably rather lateral or zigzag in position and the fœtus may permit of considerable passive movement within the abdomen. The sac of pregnancy is but rarely distended by the liquor amnii and the facility with which the various parts of the fœtus can be palpated is quite remarkable. Sometimes there is hardly any liquor amnii and the trunk and the extremities of the fœtus can be felt to be lying immediately beneath the abdominal walls; a limb may be isolated and even taken hold of under favourable conditions. The parts of the pregnancy most liable to be mistaken for each other are the placenta and the head. The placenta being almost certainly attached to the tube (or its remains) should be lower in position. If Chapter VII. (on tubo-abdominal pregnancy) have been thoroughly followed, it will be remembered that the placenta usually receives its main blood supply from the vessels of the broad ligament. These lie in the pelvis underneath the placenta, and in many cases it will only be by the periphery or edge of the latter that the hæmic murmur or "souffle" can be conducted to the ear of the examiner. Consequently the sound may be faint or even absent. On the other hand, the fœtal heart is peculiarly accessible, and the ease with which its beating can be detected and the clearness of the heart-sounds are noticed by nearly every observer.

While the hands of the surgeon are examining the child there is no clear indication of any containing-sac alternately expanding and contracting round the fœtus.

On vaginal and bimanual examination the cervix is usually found to be soft and open, the uterus is displaced towards one side of the pelvis, only slightly enlarged and obviously distinct from the child. It is this distinctness or separateness of the uterus from the pregnancy throughout the whole of its course which specially characterizes this form of pregnancy, accounts for the very little sympathy or enlargement of the organ and renders the extra-uterine position of the pregnancy an easy matter to determine. This also, together with the apparent absence of any covering for the fœtus, the clearness of the fœtal heart-sounds and, perhaps, the weakness of the placental souffle, will argue a tubo-abdominal pregnancy rather than a tubo-ligamentary one.

Is the uterus definitely and decidedly distinct from the pregnancy? This is the all-important question, for nearly everything I have described as characterising the abdominal position of the child may be wonderfully simulated by a normal intra-uterine pregnancy when the walls of the uterus are unusually thin. This extraordinary thinness of the uterine walls occasionally encountered, with or without "hydramnios," or excess of the amniotic fluid, has been noticed by many observers. One of the first to remark it was Dr. Ingleby, in 1834. In its extreme condition it is very curious and needs to be seen in order to be thoroughly believed. The fundus uteri cannot be found apart from the pregnancy, and this should excite the strongest suspicion *against* an extra-uterine position for the child. If the independent existence of the uterus cannot be demonstrated, especial care and patience should be employed in watching, with the hand on the abdomen, for the slightest indication of a uterine contraction. If the loosely-lying limbs of the child do temporarily disappear and give place to the rounded arch, however feeble, of a containing sac, the presumption is in favour of an intra-uterine pregnancy.

In the earlier stages of a growing tubo-ligamentary pregnancy, the tumour may be either central or lateral. In the posterior variety it is probably very nearly central from the outset. From the experience recorded on page 95, regarding the early history of two cases of this variety, it would appear that the tumour of pregnancy may be so centrally situated and the uterus so united to it—probably so spread out on its anterior surface—that early pregnancy within the uterus is very closely simulated.

From a careful study of many cases of undoubted tubo-ligamentary pregnancy, in which there was persistent growth with but little or no history of hæmorrhage, I have been struck by the fact that through all the stages of growth a central and symmetrical tumour was the rule rather than the exception.

This needs some emphasis, because the tumour figured on page 106 is so characteristic of broad ligament *infiltration*—of broad ligament hæmatoma or of cellulitis—that the natural habit of mind is to look for a broad ligament pregnancy in a similar position and with similar features.

The truth is that this lateral fixed groin tumour is characteristic of an *anterior* tubo-ligamentary pregnancy, and especially of one in which considerable bleeding has occurred on or after extrusion of the fœtus from the tube, but it is not characteristic of the posterior or retro-peritoneal variety, which is that more often met with.*

An example of living tubo-ligamentary pregnancy of the anterior variety at nearly four months' growth is afforded by the case of Dr. Walter S. A. Griffith, recorded by him in the "Obstet. Trans.," vol. xxxiii., p. 126.

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* It may be well to remark that many cases of extra-uterine pregnancy with groin tumour are supposed to be ligamentary when they are not. These have been explained on page 107.

As I wrote in 1895:—"Intra-peritoneal hæmatocele may closely simulate a broad ligament effusion. When the abdomen is opened the black blood clot is often seen lying beneath a membrane which looks like a layer of lifted peritoneum. When this is broken through, the hand enters a space with roughened walls, from which blood clot only, or this with placental débris, or possibly a fully formed fœtus, placenta and blood clot, may be readily extracted, and this space may easily be taken for a cavity formed between the layers of the broad ligament by the growth of pregnancy.

"I have frequently started an operation under these circumstances, supposing the case to be a broad ligament pregnancy, but on closer examination, often after finding and unrolling the Fallopian tube, which was plastered to the side of the pelvis toward the bottom of the cavity, I have been able to prove beyond all possibility of error that the whole of the hæmatocele had been intra-peritoneal throughout.

"Broad ligament pregnancy undoubtedly does occur (by rupture of the tube into the space between the layers of the broad ligament), but is not nearly so common as many have supposed." ("Brit. Gynæcol. Journal," May, 1895).

"Mrs. V., aged 32, married 11 years, without previous pregnancy. Regular until April 3rd, 1889, when the flow lasted only one day. Since then (to July 4th) there has been no recurrence. The breasts are large, and present well marked, the characters of pregnancy. The linea alba is pigmented.

"The abdomen is slightly distended by a rather hard, tender, fixed swelling occupying the right iliac region, extending upward from Poupart's ligament midway to the umbilicus, and to within 1½ inches of the linea alba. This is dull on percussion and not perceptibly affected by complete evacuation of the bladder. It extends a little way into the pelvic cavity, and on bimanual examination it is identified as a spherical, not very well defined mass, the size of a fœtal head, displacing the uterus to the left side and fixing it there. The uterine sound passes 2½ inches to the left of the tumour."

After operation and subsequent careful post-mortem examination, Dr. Griffith writes:—

"The sac occupied the whole of the right half of the pelvic cavity, the uterus and rectum, being pushed to the left. The peritoneum passed from the anterior surface of the uterus directly on to the abdominal wall; the peritoneum of the posterior surface of the right broad ligament passed directly from the right posterior border of the uterus to the middle of the anterior surface of the rectum.

"There was a considerable quantity of liquor amnii.

"The fœtus was three inches in length, from buttocks to vertex, and appeared to be normally developed. It was alive at the time of operation."

The hardness, fixity and tenderness of the extra-uterine tumour formed by this pregnancy are in decided contrast to the features of the purely tubal or tubo-abdominal pregnancies that we have been recently considering, and I think we shall find throughout that the tubo-ligamentary pregnancy is harder and more fixed, the ligamentary sheath mooring it and protecting it like an artificial or "pseudo" uterus.

In the posterior variety of tubo-ligamentary pregnancy, very similar hardness and fixity are found, but the tumour is much more central and symmetrical. As I remarked on page 74, these retro-peritoneal cases form, I believe, the majority of broad ligament pregnancies, and the next two illustrative cases will belong to this variety.

The first of these is a broad ligament pregnancy of about six months' duration which was removed by vaginal section by Dr. Donald, of Manchester, and reported by him to the Obstetrical Society on January 4th, 1899.

"Mrs. W., aged 33, married one year, was admitted to St. Mary's Hospital on July 20th, 1898. She was last properly unwell on January 20th, but had some slight discharge in February and March. She had had no previous pregnancies. The patient had considered herself to be pregnant and had felt movements in June.

"On examination the abdomen is found to be uniformly enlarged by a tumour which reaches about half way between the umbilicus and ensiform cartilage. The tumour can be divided into portions: low down at the left side superficially is felt a firm portion; on the right upper part something like a fœtal limb is made out, while the general surface of the tumour is of a soft solid consistence.

"Percussion note over the tumour is dull: elsewhere it is resonant. A souffle can be heard but no heart sound.

On bimanual examination the uterus is found enlarged to the size of a two months' pregnant uterus, is pulled upwards and directed to the left. The cervix is close to the pubes, and behind this, the vaginal fornix is bulged by a firm mass, ovoid in shape, the size of a large orange. On the surface of this one can feel sutures.

"The uterus can be distinctly mapped out bimanually in front of the tumour, the mass felt through the vaginal wall is unmistakably a fœtal head and the signs of pregnancy are well marked."

(On August 18th, 1898—after exploratory abdominal section—the child was delivered through a posterior vaginal incision by cranioclasm. The patient made a good recovery). (Obstet. Soc., Jan. 4th, 1899, and private sources).

As an example of a living tubo-ligamentary pregnancy which advanced to the end of the eighth month, I will take a case of Dr. Cullingworth's ("Obstet. Trans.," vol. xxxv., p. 155).

"Mrs. X., aged 25, married two years, one child fourteen months ago, no miscarriages, was admitted to St. Thomas's Hospital, March 27th, 1890. She menstruated regularly until August. In this month the expected period did not appear, and although there have been some irregular hæmorrhages since, there has been no proper menstruation. The abdomen was first noticed to be enlarging in October. Fœtal movements were first observed in December, and continued to be felt up to the third of March, when they finally ceased. The uterine souffle had been heard by the medical attendant, but not the fœtal heart."

On examination (three weeks after the supposed death of the fœtus) it was found that "the whole abdomen was very much distended by a large elastic tumour, fairly central and symmetrical. A rounded prominence three inches in diameter was visible beneath the abdominal wall, to the left of the middle line and 2½ inches below the umbilicus. This swelling underwent alternate contraction and relaxation—no similar contraction occurred in the rest of the tumour.

"Above this swelling a groove ran across the tumour. The percussion note was dull over the whole tumour. The flanks were resonant. At the upper and left part of the tumour there was a rounded portion, hard and more solid than the rest, giving, when handled, a sensation as of the grating of loose bones over each other.

"Per vaginam the os uteri was situated in front on a level with the summit of the symphysis pubis. The cervix admitted the tip of the examining finger and was of soft consistence. Posteriorly the vaginal roof was depressed by a large smooth swelling, partly fluid and partly solid, continuous with the main tumour in the abdomen. The uterine canal was ascertained by the sound to be four inches in length, the point of the instrument being felt in the contracting prominence already mentioned which was thus proved to be the body of the uterus."

(At the operation the fœtus and placenta were successfully removed from a sac formed by the enormously distended right broad ligament. "The uterus, corresponding in site to the contractile prominence seen before operation, lay to the left in front of and attached to the sac.")

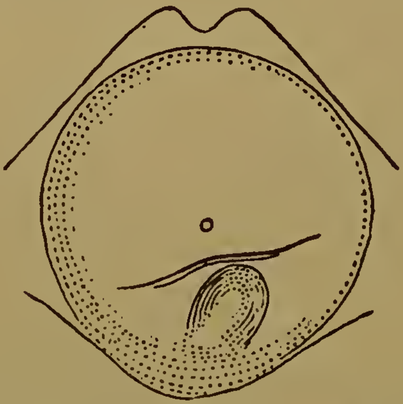

Fig. 55.—To illustrate Dr. Cullingworth's case.

The consideration of these cases will enable us to direct our thoughts toward those distinguishing features which are characteristic of living tubo-ligamentary pregnancy:—

1. The abdomen is distended generally and sometimes symmetrically.

2. The fœtus can only be palpated in certain situations.

3. The pulsations of the fœtal heart are not always elicited while the placental souffle is usually very audible.

4. The uterus is considerably enlarged, closely attached to the sac of pregnancy, and, to some extent, raised by its growth. The cervix is soft and open.

Compared with the tubo-abdominal this pregnancy is a fixed and obscured one. The sac largely hides its contained pregnancy and the fœtus is not visible and palpable in its entirety as in tubo-abdominal pregnancy. The placenta may often be carried upwards by the growth of the pregnancy and become specially accessible to abdominal auscultation. Therefore the placental souffle may be quite as audible as in normal pregnancy, and if the placenta be evidently uppermost the danger of displacement or rupture and internal hæmorrhage (with faintness, blanching and fatal collapse) will still persist, though all the earlier period of danger has been passed successfully.

Though the pregnancy is contained in a sac the latter is very often not of uniform thickness, and in some parts the child may seem to be very near the surface, and may be more easily palpated than when in utero. In the anterior or sub-peritoneo-abdominal cavity, where part of the sac of pregnancy may be almost subcutaneous, abdominal palpation of some limited portion of the fœtus may be very easy, and "ballottement" of the fœtus readily carried out, and if the part accessible be the upper part of the trunk (thorax or back) the fœtal heart-beats may be well heard.

In the posterior or retro-peritoneal variety of displacement, the pouch of Douglas may present similar facilities for direct examination. The head and its sutures may be distinctly recognised, as in the case of Dr. Donald, or, when the fœtus is in a different position, the fœtal limbs may be palpated with great facility (Winter). Careful examination of the parts behind the uterus may accordingly yield important information, and in the early stages of pregnancy, examination by the rectum may reveal an abnormality that otherwise would be overlooked.

One of the most striking contrasts which advanced tuboligamentary pregnancy presents to the tubo-abdominal form lies in the associated condition of the uterus and its relation to the pregnancy. The marked enlargement of the uterus, its elevation, its occasional position as a smaller tumour fixed on the front wall of the larger tumour of the pregnancy, and causing a furrow or ridge where the tumour of the pregnancy overtops the fundus of the uterus, all combine to form a striking picture which when once seen will never be forgotten.

Sometimes (as in Case 4, of my own tables) the uterus is in much less intimate relation with the pregnancy, but it is always larger and never so free as in tubo-abdominal pregnancy.

A reference to the note on page 81 will at once explain these differences.

If the broad ligament tumour of the pregnancy be intimately attached to the uterus, the uterus will participate in the elongation and enlargement of the sac. If there be less intimate attachment the broad ligament tumour may develop independently like a pedunculated parovarian cyst.

The differential diagnosis at this stage consists in the separation of advanced abdominal and ligamentary pregnancies from :—

1. Intra-uterine pregnancy.
2. Pregnancy in one-half of a double uterus.
3. Pregnancy in one horn of a bicornuate uterus.

1. The differential diagnosis of tubo-abdominal pregnancy from intra-uterine pregnancy with extreme thinness of the uterine wall has already been considered (p. 132). With this exception, there can hardly be any necessity for doubt or for any deliberate process of exclusion in the case of true tubo-abdominal pregnancy. The absence of any containing-sac about the fœtus is its distinguishing feature, and when there is no difficulty in ascertaining this as well as the separate existence of the uterus, there can of course be no question as to the nature of the pregnancy.

The case is different with tubo-ligamentary pregnancy. Here there is a containing-sac. The uterus is often intimately incorporated with one side or aspect of it—just as so often happens in other intra-ligamentary growths and tumours—and it may not always be an easy matter to determine whether the sac of the pregnancy is within the uterus or outside it.

In some cases of intra-uterine pregnancy the uterine body is by no means distended equally: one part of the uterus may be very much distended, thin and fluctuant with the amniotic fluid, while another part appears to be firmer, thicker and more contracted. Sometimes, in mid-pregnancy, this may be due to a special attachment of the ovum, and to direct, local distension of one part of the uterus (see p. 119), at other times, the same or a very similar phenomenon may be produced by myomatous or other thickening in the wall of the pregnant uterus, or by some unusually vivid contrast between the placental and fœtal areas.

Cases of this description simulate ligamentary pregnancies, and when there is diagnostic doubt, the various conditions liable to cause confusion should be carefully considered.

As already stated, regular contractions and relaxations of the sac are strongly suggestive of an intra-uterine position for the fœtus. Whether these ever occur in a ligamentary sac containing some muscular structure is doubtful. This is a point which requires further observation, but so far as we know at present, the large intra-ligamentary sac of an advanced tubo-ligamentary pregnancy does not contract rhythmically. The uterus does—so also may the distended but unruptured tubal sac of a purely tubal pregnancy but not, I believe, the distended broad ligament.

In Dr. Cullingworth's case (p. 135) it is very noticeable that while "the uterus underwent regular contraction and relaxation no similar contraction occurred in the rest of the tumour." This observation was made after the death of the fœtus; similar observations are needed during the life of the pregnancy.

When the uterus is stretched and locally incorporated with the wall of the broad ligament sac, the ridge or furrow between fundus and sac is often accessible, and this may be a valuable guide to bimanual palpation.

If the sound be used to confirm the opinion formed by the bimanual examination it must be remembered that the uterus is often very considerably lengthened and enlarged by the growth of the pregnancy. There will, however, probably be no free movement of the sound within the cavity of the uterus and the tip of the sound may perhaps be felt to correspond with the protuberance of the fundus.

2. Pregnancy in one half of a double uterus is only perplexing to those who have no practical knowledge of the condition. If double uterus be first encountered during labour the condition may be temporarily very puzzling. One case I recorded in 1884 is a good example;—

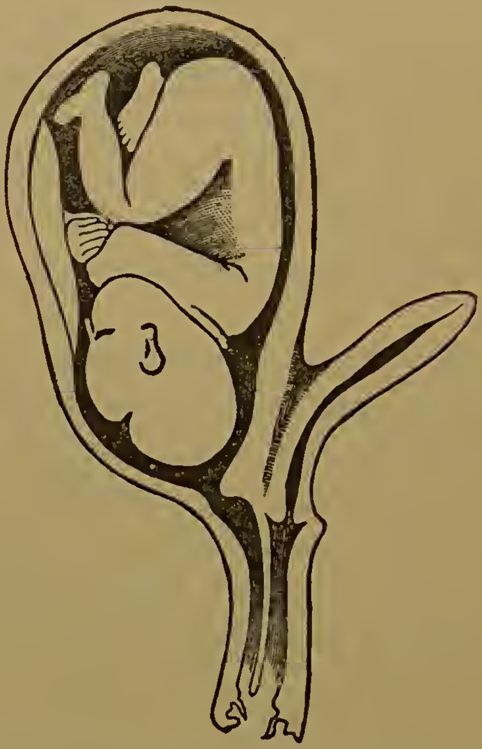

FIG. 56.—Double uterus and vagina. Pregnancy in right uterus. (Diagrammatic).

The patient, Mrs. Y., a primipara, had complete double uterus and vagina (as in the figure) and was first seen when in labour.

She was lying in the usual (English) obstetric position on her left side.

On examination, the finger of the accoucheur naturally passed into the left vagina which was small and empty, and encountered the little, undilated cervix of the left (non-pregnant) uterus, while the head of the child could be plainly felt, above and to one side of this, apparently crushing through the vaginal roof.

The child occupied the right uterus and was, of course, born through the right vagina. ("British Medical Journal, January 12th, 1884.")

The double vagina and uterus in this case only needed a complete and thorough examination for its discovery, and with this the explanation of the pregnancy was at once evident.

Similarly, when the vagina is single and the "doubling" is limited to the uterus, the double cervix felt—or seen through a vaginal speculum—will at once suggest the possible explanation of any abnormality, and the non-pregnant uterus can be isolated from the pregnant one by the passage of the sound.

3. Pregnancy in one horn of a bicornuate uterus is more difficult to diagnose, and a much more important matter to deal with, especially if the pregnant horn be in any way rudimentary, insufficient for the growth of the fœtus or insufficiently connected with the external passages for its birth.

In this case, the horn usually ruptures about the fourth or fifth month but the pregnancy may proceed to term and then may be very like a ligamentary pregnancy.

The rudimentary horn, however, is usually attached at some distance below the fundus of the developed half of the uterus and consequently the asymmetry produced is almost the exact converse of that which has been described as existing in primary interstitial pregnancy.

This is an easy point to remember, and its recollection may materially assist the surgeon either in forming a diagnosis or in recognising the condition when the abdomen is opened. For a cornual pregnancy of this description is essentially extra-uterine and must be treated as such.

In some cases, as in one that came under my own observation, the pregnant horn is well developed and its connection with the cervix offers no obstruction to natural labour.

In this case the pregnancy is essentially a normal one and the only danger is that of regarding it as extra-uterine and serious because the non-pregnant horn is recognised as distinct from the pregnancy and empty. In the case to which I have referred the fusion of the two bodies into one cervix and the angle between them could be fairly well made out on bimanual examination, and directly the mind grasped the possibility of a "doubling" of the uterus there was no difficulty in recognising the condition.

In all extra-uterine pregnancies which go to term there is a more or less well-marked period of false labour and with this we have certain warnings, opportunities, and signs which should be of special interest to the accoucheur. The latter is usually sent for on the supposition that labour is beginning and it is of very great importance that this opportunity for diagnosis and advice should not be neglected. Whenever the cervix is found to be small and somewhat displaced and to have no proportionate relation to the history and symptoms of a full term pregnancy the case should be thoroughly investigated and a full examination made. Especially care is necessary that the complaint of the patient be not lightly dismissed as simply a "false alarm." In extra-uterine pregnancy the "pains" are abdominal and are chiefly connected with the movements of the fœtus. They are probably accompanied by some vaginal discharge and sometimes by expulsion of membrane. The pains last for several days, often preventing sleep. Finally they cease —cease suddenly—and the movements of the child are no longer felt. Soon after the breasts enlarge and temporarily fill with milk, but no encouragement being afforded to its flow, the draught soon ceases. All symptoms directly connected with the pregnancy (except the enlargement of the abdomen) permanently subside and the patient either enjoys a moderate amount of health and resumes her usual duties carrying her dead child with her, or septic changes occur within the sac, rigors and fever follow, and the patent drifts into a "typhoid" state from which nothing but the removal of the putrid contents of the sac can rescue her.

This brings us to the consideration of full-term extra-uterine pregnancy after the death of the child. In tubo-abdominal pregnancy the child is in all cases so easily distinguished that notwithstanding all movement is lost there is but little real difficulty in the diagnosis. The shape of the abdominal tumour, and especially the detection of the fœtal limbs through the abdominal parietes, combined with the evidence of an empty uterus, will in all cases establish the nature of the case (fig. 57). The differential diagnosis from intra-uterine pregnancy, which before "term" and when the child was living, we found to be of first importance, is now (probably) no longer a difficult one, the sound can be passed without danger, and the diagnosis is correspondingly lightened. But in the tubo-ligamentary pregnancy, and especially in the posterior ligamentary form, the diagnosis is often rendered exceedingly obscure and difficult by the death of the fœtus, the more so when several months have elapsed since its life was ended. Menstruation may have been re-established and the patient does not necessarily volunteer the slightest information which would direct the mind towards the causation of the tumour. There is, of course, no fœtal heart-beat, no fœtal movement, no placental souffle, the patient's breasts have lost all indication of a pregnant state, and if septic disturbance has already taken place the patient may be in no condition to answer intelligently the questions of the examining surgeon. There

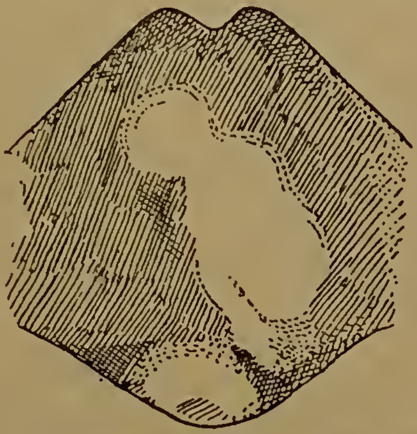

FIG. 57.—External configuration of abdomen in Case 3.

is nothing but the large fixed abdominal tumour, the nature of which may be hidden by the thickness of its walls (fig. 58). The suspicion of pregnancy, while the tumour was forming, if alluded to, is so common among all women with gradual abdominal enlargement that its significance is very easily unrecognised. No class of case may require more painstaking patience and perseverance in its investigation. Little by little, however, the history of the pregnancy may be gathered. The nine months' slow enlargement of the abdomen, the amenorrhœa, the fœtal movements (?), the spurious labour or something corresponding to it, the history of the breast-signs, all should be inquired after and their presence or absence noted. Sometimes, on deep palpation of the tumour, one may feel the resisting body of the fœtus after displacement of the fluid which surrounds it—a valuable sign, which can only be simulated by a solid tumour, probably papillomatous or malignant, floating in a cystic cavity. The differential diagnosis under these conditions will be from ovarian tumour—simple, suppurating, or malignant. The mimicry of the last condition to extra-uterine pregnancy with retained fœtus, may be curiously complete. In one case on which I operated the patient had a large abdominal tumour which had been forming for twelve months. Menstruation had ceased from the first

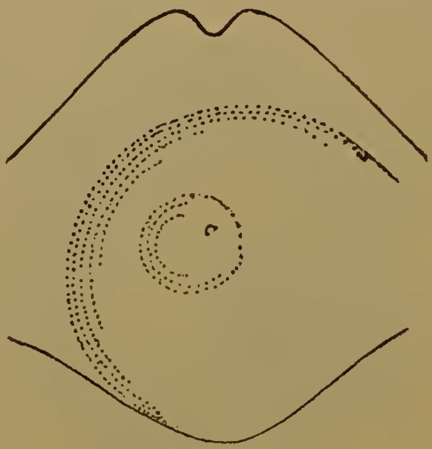

FIG. 58.—External configuration of the abdomen in Case 4. The inner circle near the umbilicus marks an area of less resistance within which it was possible to palpate the fœtus.

appearance of the tumour. The patient considered herself pregnant and prepared for the birth of the child. The medical man was engaged for the confinement, and at the end of nine months some kind of spurious labour (or what was taken for such) undoubtedly took place, but no child was born. When I saw her some three months later she had rapidly emaciated, there was evening pyrexia, and the abdomen was greatly distended by an irregular tumour more marked on one side of the body. On vaginal and bimanual examination the uterus was found to be independent of the tumour and empty, and on palpation in the pouch of Douglas the finger, after displacing fluid, felt two solid bodies which resembled the feet and ankles of a fœtus at full term. At the operation there was malignant tumour of both ovaries with localised ascites and two movable malignant nodules floating in the pouch of Douglas. In difficult cases the evidence may be insufficient to warrant a certain single diagnosis, but it should be sufficient to offer an alternative selection, and to guard the surgeon from any unpleasant surprises or difficulty after opening the abdomen.

The clinical diagnosis of primary tubo-uterine or interstitial pregnancy cannot as yet be described from the experimental standpoint. The only possible symptoms which have been noticed before rupture are those of fœtal movements exceptionally plainly felt and slight abdominal pain (Tait, "Ectopic Pregnancy," p. 46).

Cases are so excessively rare that very few observers have had any real opportunity of making a diagnosis.

In preparation for such an opportunity when it arises there may perhaps be some practical clinical advantage in grouping with this form of pregnancy the somewhat allied one of pregnancy in a rudimentary uterine horn. Both are abnormal uterine pregnancies, both are likely to rupture with diffuse hæmorrhage about the fourth or fifth month; in both, the tumour of pregnancy from a very early period is rather abdominal than pelvic and both may be said to produce a curious distortion of the uterus. So far, the pregnancies have points of similarity. The relations of the tumour of pregnancy itself, however, in the two cases are sharply contrasted as has been already pointed out; the opposite Fallopian tube appearing to be inserted very low in interstitial pregnancy and relatively higher to the point of junction in a rudimentary horn pregnancy (fig. 59).

Further, the rudimentary horn pregnancy is sharply bounded everywhere, the developed half of the uterus sloping away from it "at an angle of some 40 to 60 degrees from the normal position," and the band connecting the pregnant horn with the uterus may be felt on rectal examination (Dr. Kelly, "Operative Gynæcology," vol. ii., p. 465), while the tubo-uterine pregnancy, although distending the uterus at one angle only, is not sharply bounded towards the uterus but is covered everywhere by uterine or tubal tissue and therefore merges into the uterus without border or demarcation.

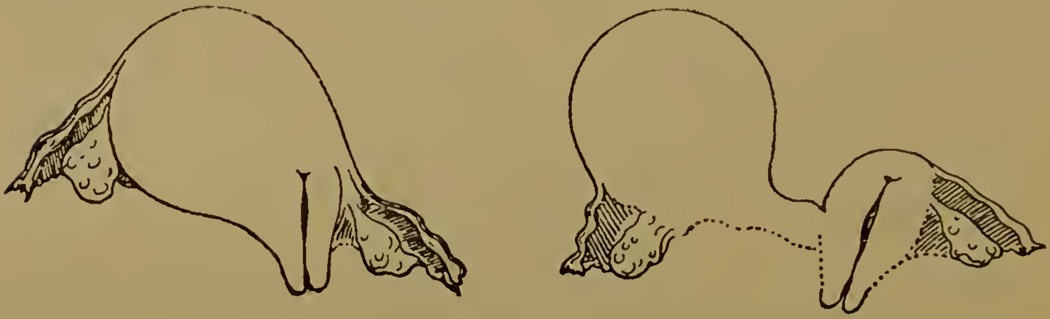

FIG 59.—Tubo-uterine (interstitial) pregnancy and rudimentary horn pregnancy contrasted (diagrammatic).

These points of contrast as well as of similarity may help to keep the features of both pregnancies in recollection and if they be insufficient to prompt a diagnosis prior to operation, their remembrance may be of decided service after the abdomen has been opened. There is an inter-operative diagnosis—the quick recognition of the pathological condition present—which is absolutely essential for the successful handling of rare or obscure abdominal tumours, and sometimes the appreciation of distinguishing features from within the cavity of the peritoneum is of more importance than a delicate perception of those less certain features which can be elicited by external observation.

The recognition of the special forms of distortion or asymmetry produced in the uterus by the presence of the pregnancies we have been considering is the point of main practical importance.

Its bearing on operative action will be considered later.

Complicated forms of extra-uterine pregnancy are rather frequently met with. Extra-uterine pregnancy may be double, it may be combined with intra-uterine pregnancy, with ovarian tumour (p. 15), with pelvic abscess (p. 180), with appendicitis, with obstruction of the bowels (p. 184), with albuminuria (p. 112), with jaundice (p. 43).

Some of these may have a definite relation to the pregnancy as cause (ovarian tumour, appendicitis) or as effect (pelvic abscess, intestinal obstruction, albuminuria) others again may be wholly or mainly accidental.

No attempt will be made to deal specially with the diagnosis of such complications. Each complication, except those which are symptomatic, like albuminuria and abscess, must rest on its own merits and be carefully and separately investigated.

The most important complication is that of concurrent intra-uterine pregnancy. Some six cases have been recorded, and in all, the tumour of the pregnant uterus appears to have been easily differentiable from the tumour of the (accompanying) pregnancy outside the uterus.

CHAPTER XIII.

TREATMENT.

ABDOMINAL AND VAGINAL SECTION.

THE treatment of extra-uterine pregnancy is essentially operative. This fact is set forth very strongly in the well-known assertion of Werth, who declares that "ectopic gestation must be considered as a malignant new growth, and therefore should be removed by operation at every stage of its development." This is a sweeping assertion, and one or two exceptions must be made to it. For example, in the latter half of a tubo-abdominal or tubo-ligamentary pregnancy, when no sign of danger is present, it may be better practice to wait for operation until a time at or about the usual period of delivery, when the child is viable and strong, than to operate earlier when the life of the child is certain to be sacrificed. Some surgeons have advised that we should go beyond this and wait for operation until after the death of the child, so as to have, if possible, a less vascular placenta to deal with. For my own part, in all cases of later extra-uterine pregnancy, with a living fœtus and without any special sign of imminent danger, I would choose whenever practicable the most convenient date in the ninth month on which to operate. I would not wait for any sign of spurious labour or seek after exact correspondence with the natural term, but I would endeavour to preform the operation under the best conditions for both lives concerned. Again, occasionally, here and there, a case of ruptured tubal pregnancy or of tubal mole with peri-tubal hæmatocele recovers without operation, and the fact must be recognised and dealt with. I have seen five or six cases of such recovery, and there could no doubt of the genuineness both of the disease and of the recovery; indeed, in one of these cases, as we have seen, the rupture in the tube and the traces of the old hæmatocele were plainly visible on opening the abdomen some two years latter. If my own experience can be regarded as at all general or typical, this would give a proportion of about five per cent. of all cases observed which may be expected to terminate by process of natural recovery. Is there anything to mark these cases out from all the rest? Not much, I think, for the swelling of the tube, followed by the further tumour of the hæmatocele, the acute attack of abdominal pain and the peritonitic sequel, may all be quite as marked as in the majority of cases. But if the case recovers without operation the pregnancy is usually destroyed by the first (and only) bleeding, and the hæmorrhagic discharge from the uterus, which during the period of abdominal hæmorrhage and pain has probably been irregularly abundant, absolutely ceases with the definite termination of the pregnancy and beginning of absorption, and the patient becomes free from pain. Under these circumstances—cessation of growth, cessation of hæmorrhage, cessation of pain—notwithstanding the pelvic tumour of the distended tube and hæmatocele—it may be right to withhold operation and give the patient, by rest in bed, by a liberal but non-stimulating diet, and by attention to all excretory functions, an opportunity of natural cure. It is worthy of note, however, that this natural cure is rarely very satisfactory, and that it contrasts somewhat unfavourably with operative methods. It requires many weeks or even months of rest for complete absorption to take place, and at the close of the process the distortion and fixity of adjacent organs (due to the prolonged presence of the hæmatocele) may still be marked and possibly permanent. In some cases, too, the fœtus may have arrived at that stage of development at which complete absorption is impossible, and if so, although apparent recovery should follow, there may be no finality about it. Months or years afterwards suppuration may occur about the retained fœtus, and the evils connected with this prove very much greater than those encountered at the earlier disturbances (*see*

Chap. XV.). Finally, in all cases the danger of waiting—the danger of temporising when any symptom of collapse or pain is present—should be thoroughly recognised and appreciated. So far as we know at present, if five patients may possibly weather the storm by months of rest 95 patients will die if surgical aid is withheld. Now, what is the prospect or prognosis after surgical treatment? In my own series of cases 42 cases of all kinds are reported with 41 recoveries and one death. In Mr. Tait's list published in 1888 we find 42 cases with 40 recoveries and two deaths, in Prof. Dührssen's tables (1897) we find 38 cases with 36 recoveries and 2 deaths, and in Mr. Mayo Robson's cases recently reported, 23 cases with 22 recoveries and one death. I have some reason to know that while these results are all very good they are not specially exceptional. If I turn to the statistics of the chief hospital with which I am connected, the Birmingham and Midland Hospital for Women, I find in the decade from 1886 to 1896 that 62 cases of ectopic gestation were operated on with 61 recoveries and one death; and smaller series of cases are being frequently reported in the medical journals, none of which show any high mortality. The mortality of all cases is not probably more than five per cent.

The operative treatment of extra-uterine pregnancy may be considered under two divisions—viz.: (1) operations in the early half of pregnancy; and (2) later operations. (1) In the first we must consider—operations for diffuse hæmorrhage and operations for localised tumour, either an intact pregnancy or hæmatocele; and (2) in the second division we shall have to deal mainly with the operative delivery of the mother at or beyond the period of term under tubo-abdominal and tubo-ligamentary pregnancy.

1. Operation for diffuse hæmorrhage may be required in—(*a*) early rupture of the tube; (*b*) later rupture of the tube; (*c*) intra-peritoneal rupture of broad-ligament pregnancy; (*d*) rupture of a peri-tubal hæmatocele; and (*e*) rupture of a tubo-uterine or interstitial pregnancy. The operation here

will of necessity involve abdominal section. It will be an operation of emergency. It will have to be done at the patient's home—very possibly at night—under uncomfortable conditions and often without skilled assistance. None of these difficulties must be allowed to excuse any laxity in surgical asepsis, and therefore the operator must himself be prepared to act as his own chief assistant, and by order and method reduce his dependence on others to a minimum (fig. 60). Some kind of operation table is an absolute necessity, for the abdominal cavity will need washing out with warm water. Plenty of boiling water must be available.

The following instruments are usually necessary :—

1 Sharp scalpel.
12 Catch forceps.
2 Pedicle needles (blunt points).
2 "Elastic" forceps (Doyen).
1 Volsella.
1 Scissors.
1 Sharp handled needle (for suture of the abdominal incision).
1 Douche or syphon-tube (for irrigation of the pelvis and abdomen).
4 Glass drainage-tubes (assorted sizes).
3 Aseptic instrument trays.
1 Sterilizer.

Silk-worm gut, silk, small-curved needles, safety-pins, iodoform gauze, wool, strapping, binder, soap, hand brush, sublimate pastilles, lysol, spirit and 12 sterilized pads (for sponging) will complete the usual "armamentarium." The pads are made of 16 layers of gauze, six inches or nine inches square and these are sewed together before sterilization. In addition to these instruments it is wise to have two wire clamps (with wire and transfixion pins) ready for use in case the rapid removal of the uterus should be imperative (*see* p. 155).

The operator, after removing his coat, turning up his shirt-sleeves, pinning a clean towel to his shoulders and thoroughly disinfecting his hands and arms by prolonged scrubbing in hot soap and water and afterwards with spirit, will find it to his advantage, especially if he have no assistant, to arrange his instruments (already sterilized) in the following order and manner. The sterilizer is placed in the position indicated in the diagram. This is filled with boiling water into which a little piece of washing soda is dropped, and in this

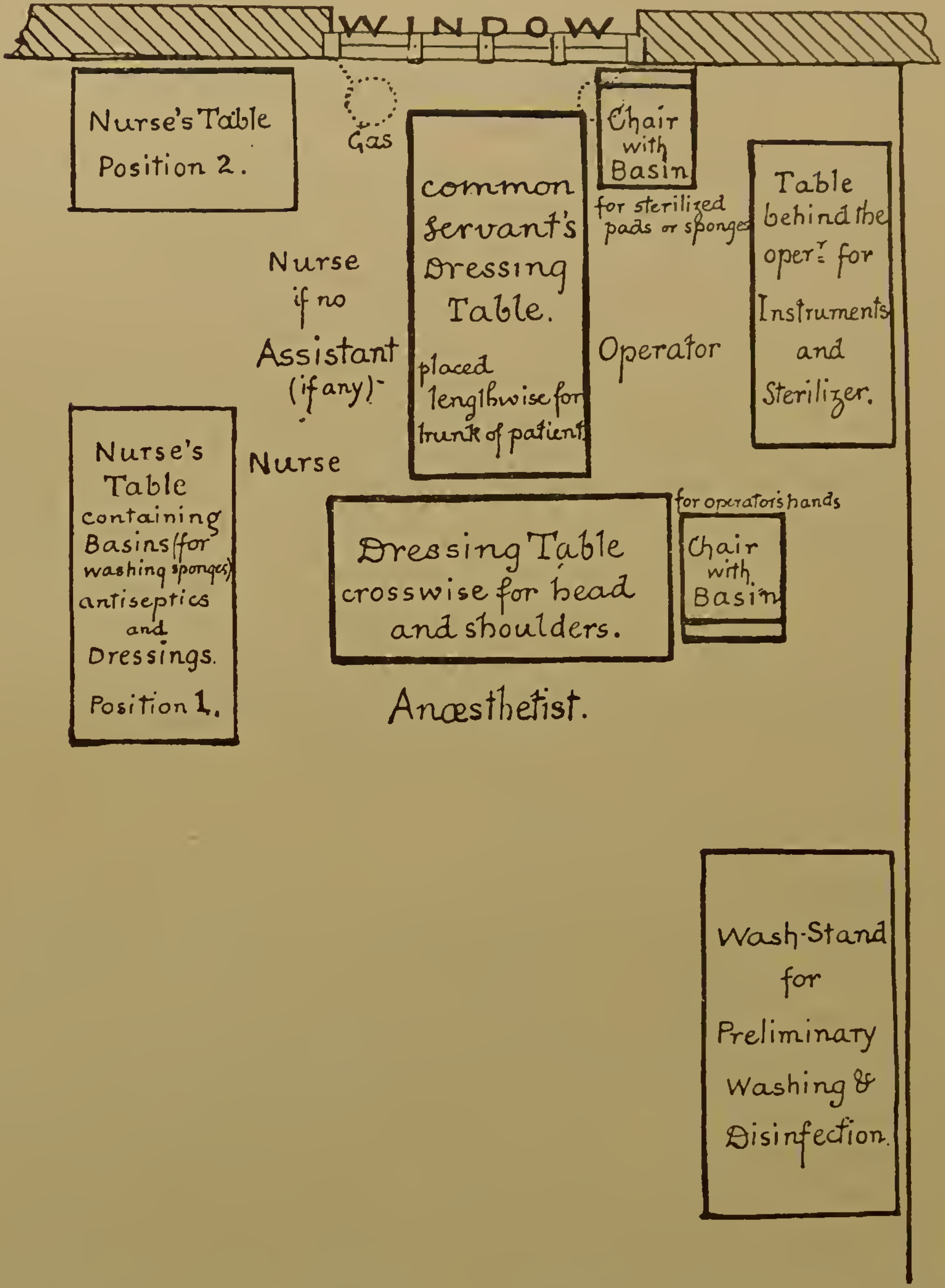
WINDOW
Nurse's Table Position 2.
Gas
Chair with Basin
for sterilized pads or sponges
common servant's Dressing Table.
placed lengthwise for trunk of patient
Table behind the oper.r for Instruments and Sterilizer.
Nurse if no Assistant (if any)
Operator
Nurse
Nurse's Table containing Basins (for washing sponges) antiseptics and Dressings. Position 1.
Dressing Table crosswise for head and shoulders.
for operator's hands
Chair with Basin
Anæsthetist.
Wash-Stand for Preliminary Washing & Disinfection.

FIG. 60.—General plan of arrangement for operation of emergency in patient's house.

bath the surgeon places his two pedicle needles armed with silk of suitable size and length (No. 5, 28 inches), eight or ten strands of silkworm gut twisted into a loop to keep them together, a small needle threaded with fine silk and the glass drainage tubes. The syphon tube is placed in a basin or bowl close to the sterilizer and before it is used the surgeon holds the metal end for a few minutes within the sterilizer. Next to the sterilizer he places a small tray containing his knife, scissors and suture-needle. Beyond this, a large tray containing the 12 catch forceps, and finally (nearest the window) a long tray holding the longer forceps and the volsella. Clean plates or dishes may be used instead of instrument trays if necessary. Behind this row of instruments he places the open box containing the clamps and transfixion pins, and by the side of this the (open) bottle of iodoform gauze and the bottle of ligatures. Everything on this table should be within reach of his right hand, while his left is touching the middle of the operating table. One of the catch forceps is placed point downwards in the sterilizer, the handles standing above the rim, and is used for taking out the needles or other instruments from the boiling water. The surgeon repeatedly washes his hands after touching any unsterilized article, and as soon as the arrangement of all things necessary is completed the lamp of the sterilizer is lighted.

No time must be lost. When the diagnosis has once been made the operation must be performed at the earliest possible moment consistent with a prepared and cleanly *entourage*. While the patient is passing through the later stage of narcosis the abdominal wall is carefully cleaned with soap and water and afterwards with methylated spirit. As soon as this is finished a final and very careful washing of the hands is carried out by the surgeon, the assistant (if any) and the nurse. The operator should be able to return to the side of his patient personally knowing that his instruments, his pads and sponges, the patient's abdomen and the hands of himself and any assistants are thoroughly and surgically clean.

The incision—made in the middle line—will probably at once disclose some confirmation of the diagnosis, the black colour of the blood within the abdomen showing darkly through the transparent peritoneum. On opening this blood and blood clot pour out freely. The fingers of the left hand are inserted into the abdomen, seize the uterus, and feel at once for the site of pregnancy, the source of bleeding. If, as usually happens, this can be identified by touch it is immediately withdrawn out of the abdomen, the parts below the tube being firmly held so as to stop any further bleeding. The operator then—with his disengaged right hand—takes the needle armed with ligature silk from the sterilizer, transfixes the broad ligament below the tube, ties off the pregnant tube with Staffordshire knot or linked double ligature and finally removes it. The abdomen is now thoroughly washed out with blood-warm water, the pelvis is specially cleared of blood clot, a drainage tube is placed in the pouch of Douglas, and the abdominal incision is closed. After the wound is dressed a binder is applied tightly round the abdomen, and if the patient be nearly pulseless she is placed in bed on an inclined bedstead with the lower extremities raised.

The operation itself is often an easy one, but there are difficulties which may interfere with its ready performance. The most important is the impossibility of seeing what one has to do. The blood continues to well up from the pelvis, and vigorous sponging may only afford momentary glimpses of the pedicle or broad ligament. In this case pouring clear warm water over the wound and packing some of the larger pads into the pelvis and round the affected tube will often prove of service. Sometimes this difficulty of vision has a more serious bearing. If the pregnancy has already escaped from the ruptured tube it may be no easy matter to detect which is the affected side and where is the source of the hæmorrhage. Under these circumstances the temporary control of the circulation with one or two pairs of Doyen's lighter elastic forceps will allow of the washing out of the abdomen and enable the operator to search for and to find the tubal rent without fear of further loss while the search is still in progress. I always take these forceps to any abdominal operation of emergency; their pressure can be nicely adjusted so that intestine even need not suffer any injury in their temporary grasp, while the higher grades of pressure are sufficient to control the broad ligaments in a case of hysterectomy. Occasionally, when a ligature is difficult or impossible to place, a pair of these forceps may be left on the broad ligament or on the side of the uterus at the close of the operation. A compression of from eighteen to twenty-four hours is usually sufficient. In diffuse hæmorrhage from the rupture and extrusion of a tubo-ligamentary pregnancy the temporary or more lasting use of forceps may be of signal service. The bleeding points may be entirely hidden, furnished largely by branches of the uterine artery; and this or firm plugging with iodoform gauze may be the only way of arresting the hæmorrhage. In tubo-uterine or interstitial rupture with diffuse bleeding, the quick recognition of the condition on opening the abdomen will be the first element of success, and the rent on one side in the upper part of the uterus and the different levels at which the tubes appear to enter the uterus should guide the operator to a quick decision. In this case the uterus should be drawn out of the wound, two transfixion pins passed, first through the peritoneum on one side of the incision, then through the uterus well below the tear, and finally through the peritoneum of the opposite side (as in the method described by myself in 1893), a "wire clamp" applied below these, and the latter screwed thoroughly "taut." The hæmorrhage is then absolutely controlled, and if the "serre-nœud" be always ready for use, the time occupied in effecting this control need scarcely be longer than that which has been used in briefly describing the method. The operator can wash out the abdomen through the upper part of the incision above the clamp, doing this carefully and thoroughly, and if drainage be considered necessary the tube can be adjusted at the upper angle of the wound. When the latter is closed the clamp is again screwed up tightly, the parts above the clamp are cut off, and the stump is surrounded with iodoform gauze. The only caution necessary to mention is the danger of any slipping of the broad ligament out of the grasp of the wire before the latter is finally tightened. This is easily avoided by transfixing the broad ligament with the pins or by holding up the appendages with forceps (if these are removed) and by screwing the clamp thoroughly tight before the parts above the wire are finally removed.

A ruptured pregnancy in a rudimentary uterine horn may require a similar method of treatment, but this is usually sufficiently pedunculated to admit of complete removal by a chain of ligatures.

Washing out of the abdomen in a simple case of diffuse hæmorrhage, as in early rupture, can often be done by pouring water from a jug directly into the abdomen, but in such a case as I have been considering, and in a patient with a deep pelvis containing much blood clot, the use of a syphon tube is more handy and more efficient. By this the stream of water is carried directly to the lowest part of the pelvis, and the upward returning stream washes out the blood clot. This "washing out" should never be omitted in cases of diffuse bleeding. Besides cleansing the peritoneum it is probably a means of conveying some fluid into the depleted blood stream, and this, followed (after the operation is over) by a nutrient injection containing brandy, and by temporary elevation of the pelvis and lower extremities is, in my opinion, more useful in overcoming shock and in restoring the pulse than is any attempt at transfusion.

In diffuse hæmorrhage the quickest and directest route to the bleeding vessels is an absolute *sine quâ non* of operative treatment, and there can be no doubt that this is attained by abdominal section above the pubes. In localised hæmatocele and in intact extra-uterine pregnancy up to mid-term, other methods of operation may be employed besides abdominal section, and we shall have to consider vaginal section under its two aspects of posterior and anterior cœliotomy

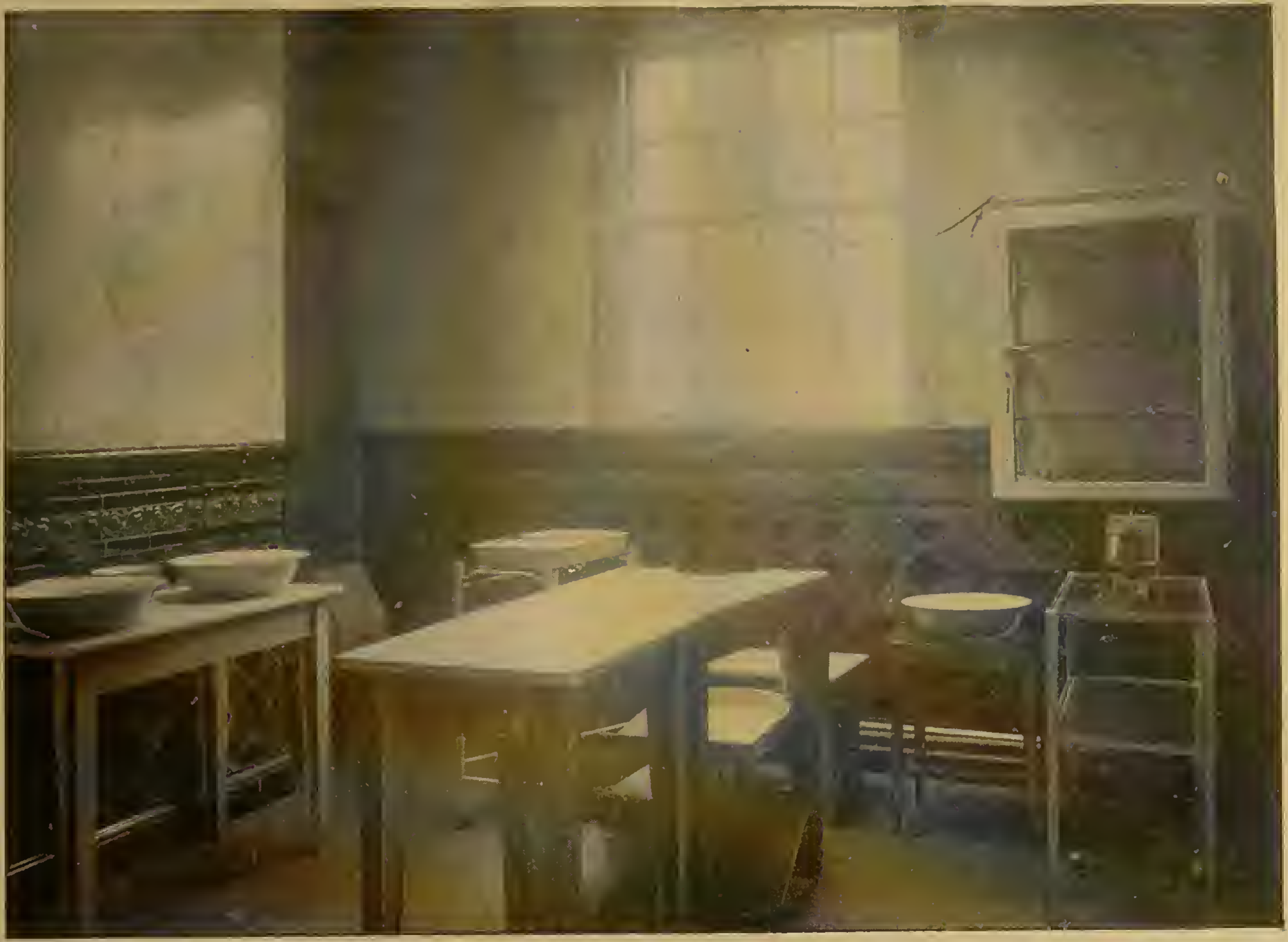

Fig. 61.

Operating Room arranged for Vaginal Section.

and also the sub-peritoneal incision in cases of anterior tubo-ligamentary invasion. In true retro-uterine hæmatocele, in which the pouch of Douglas is itself distended with blood, posterior vaginal cœliotomy—the direct opening of the pouch of Douglas from the vagina—is obviously the proper method of treatment, and no surgeon would probably dream of any other. Under this condition the operation is very simple. A free incision is made in the middle line, the contained blood and blood clot are gently washed out by a stream of warm water carried within the cavity, nothing is done to interfere with the upper limiting adhesions or roof of the hæmatocele, and after free evacuation the pouch is drained by a tube or by iodoform gauze.

In peri-tubal hæmatoceles which occupy the whole or a greater part of the pouch of Douglas an extension of the same method may be employed with advantage, especially if the bulk of the swelling be evidently within the pouch of Douglas. In this case, however, every aseptic precaution is just as necessary as in an abdominal section, and before beginning to operate the hair of the vulva is shaved and the vulva and vagina are thoroughly cleansed and disinfected.

In carrying this out, I usually employ, firstly, a 2% solution of lysol, secondly, methylated spirit, and, finally, a solution of corrosive sublimate (1 in 1000). For the disinfection and for the subsequent operation the patient is placed in the "lithotomy" position on a good table, and the vagina is kept open by the valuable self-retaining speculum of Auvard. The patient's legs are clothed with warm clean stockings, and a large thick sterilized towel is wrapped and pinned around each leg. One sterilized towel is placed over the abdomen and thighs of the patient and another under her buttocks. The surgeon sits facing the vulva of the patient and there should be a good light directly behind his head. The patient is anæsthetized previously, and is therefore unconscious before any of this preparatory work is begun (fig. 61).

On a low table to the right of the operator's stool or chair, and within easy reach of his own hand, the following instruments (already sterilized) are arranged in aseptic trays.

1 Uterine sound.
1 Bladder sound.
3 Pairs of volsella.
2 Scissors curved on the flat (one short, another longer).
6 Small forceps.
2 Doyen's forceps (medium size).
1 Blunt ring forceps.
1 Blunt curved curette or spoon.
1 Simon's anterior speculum, with three blades of different sizes.
1 Needle holder.

To the left of the operator is a similar table containing the basin of sterilized pads. For most operations 9 of these are sufficient—six of usual size (6 in. square), and three half size, rolled up and tied with silk. These latter are for pushing into the pelvis, when necessary, after the peritoneum has been opened.

The assistant stands by the side of the patient's right knee—to the operator's left—and has special charge of the "sponging." A second assistant (if present) takes up a corresponding position on the opposite side.

A nurse has charge of a small sterilizer for instruments, and keeps in readiness for the surgeon's use:—

1. Sterilized silk for ligatures.
2. A blunt curved pedicle needle, armed with strong silk.
3. Sharp curved needles threaded with fine silk or catgut for suture of the vaginal wound (if this is considered desirable).

Another nurse takes charge of the soiled "sponges," and if no sterilized douche be laid on to the operating room, has a portable douche in readiness for irrigation during the later stages of the operation.

The uterus is steadied by volsella applied to the posterior lip of the cervix, and the posterior vaginal vault is opened behind the uterus with scissors curved on the flat. On reaching the pouch of Douglas blood and bloody serum will probably be found within it. There are, as a rule, no adhesions at the lowest part of the pouch. On inserting the fingers the tumour of the hæmatocele will be plainly felt, and all the lower part of it may be very thoroughly explored, especially if the disengaged hand be placed on the abdomen above the pubes and the examination of the mass be conducted "bimanually." If the upper aspect of the tumour be pressed downwards by the left hand of the surgeon placed over the abdominal towel (and Auvard's speculum be withdrawn) it will be found that the whole tumour usually becomes quite accessible to the exploring fingers of the right hand of the operator. As a rule these enter the ruptured and distended sac of the expanded tube, and the latter may be easily recognized as forming an imperfect sheath or covering to the pregnancy. At one part this forms a definite sheath or cup. At another (the site of rupture or bleeding) the sheath is usually wanting. The mole of pregnancy is carefully detached from this sheath, either by the fingers alone or by the help of ring forceps or blunt spoon, and removed from the pelvis into the vagina. Douching of the pelvis with hot water is now freely practised until all the accessory blood and blood-clot has been entirely washed away. At this stage it will be quite evident if there is any pelvic bleeding still going on. If so, the parts may often be visibly examined by the aid of Simon's Speculum introduced within the vaginal incision, and the hæmorrhage may either be controlled *in situ*, or the tube may sometimes be separated from its adhesions, drawn down and removed (as in Case 41). All red or active bleeding from within the abdomen should be entirely stopped before the operation is finished. By the aid of douche and speculum it is usually quite easy to be certain on this point, and to find, if necessary, any bleeding vessel. If active hæmorrhage still goes on, however, and the source of it seems out of reach, the abdomen must be opened above the pubes.

In the majority of cases, if the operation has been done carefully, when all the old blood and blood clot have been washed away there will be no bleeding or only a little from the sides of the incision (fig. 62).

Then a thick pledget of iodoform gauze is carried into the cavity where the pregnancy has been. This is lightly packed with the gauze, and the end of the gauze, after plugging the vaginal incision, is allowed to rest in the upper part of the vagina. The vaginal incision is again examined to see if there is any bleeding in this situation, and if not, the speculum is removed. The vulva is cleansed and the patient is replaced in bed.

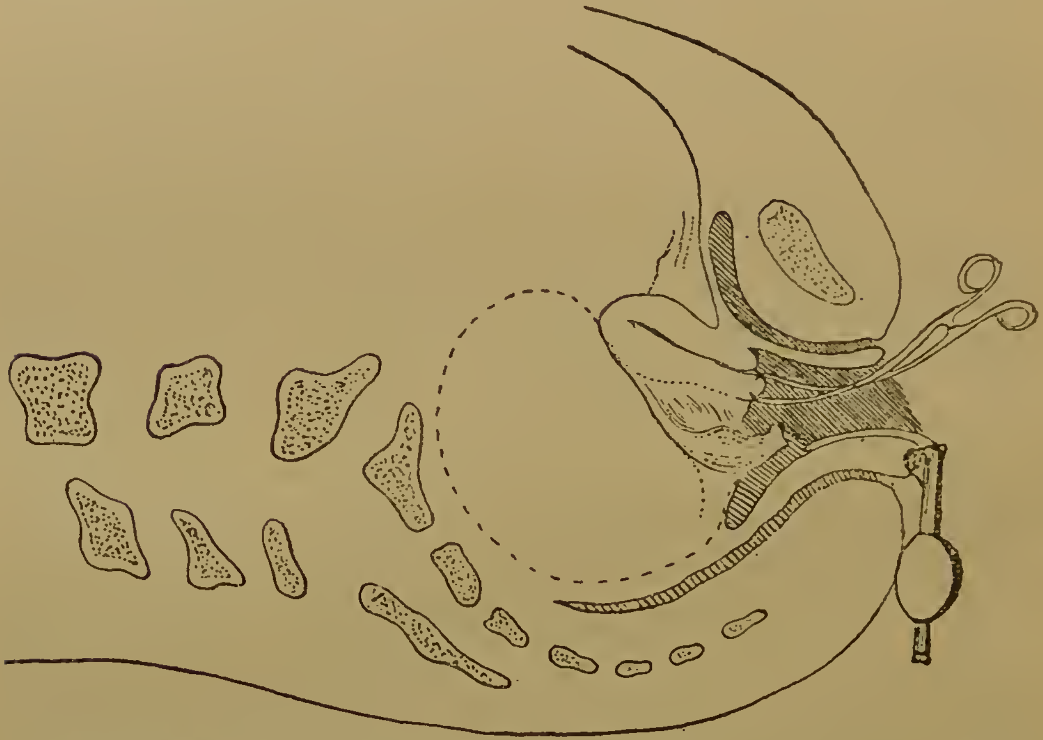

FIG. 62.—To illustrate the removal of a tubal pregnancy by posterior vaginal section. The vagina is held open by Auvard's speculum, the posterior lip of the cervix is held by volsella, the hæmatocele around the tube has been well cleared out by a posterior vaginal incision, and the right uterine appendages have just been drawn outside the abdomen into the vagina and are ready for ligature and removal (compare with record of case on p. 117 and fig. 47).

A few cautions may be necessary with regard to the conduct of this simple operation. It should be an operation of election for certain cases, those are most favourable for its employment in which the vagina is capacious and the tumour is mainly posterior to the uterus. It should never be used for diffuse hæmorrhage unless every convenience of light and operation table be in readiness.

The bladder should be thoroughly emptied immediately before the operation is begun. No violence should be used, the blood-clot and débris should be extracted gently. The gauze drain should rest partly within the peritoneal cavity and the other part in the upper third of the vagina, and no portion of it should protrude or be visible at the vaginal entrance. The urine is better withdrawn by the catheter until the drain is removed on the fourth or fifth morning. Two rare but disquieting accidents following the operation are hæmorrhage and severe sacral pain.

After a posterior vaginal incision, whether in this operation or in vaginal hysterectomy, it is quite possible to get severe, dangerous, or even fatal hæmorrhage from the incision itself. The farther away the incision is from the cervix, the greater appears to be the danger. Plugging is quite sufficient to stop the ordinary bleeding, but in some cases sutures are absolutely necessary. In introducing the tampon of gauze, it is important to avoid pushing the peritoneum in front of the gauze and thus opening up the subperitoneal (raw) tissues. Severe temporary sacral pain is a very exceptional sequel to operation, but I have met with two cases in which it was a special feature. I am inclined to think that this is excited by the dragging of the uterus on the partially divided utero-sacral ligaments (or muscles), and that a free transverse incision may be preferable to a smaller opening.

I am more and more satisfied with the opportunities for good and careful work afforded by this operation and by the extremely satisfactory results obtained. It may even be used with advantage in cases where there has been no previous pregnancy and in which the vagina is comparatively small. In most cases there is hardly a trace of any peritoneal irritation after the operation is done, and the patients recover as easily as from the most trivial interference. I now always wash out all remains of the pregnancy, all blood-clot and blood from the pelvis until the stream returns perfectly clear and no trace can be felt of any abnormal retained product. Judging by the directness of the return stream and by the subsequent history of the cases this may often be done without disturbing upper adhesions and very possibly without really opening the general cavity of the abdominal peritoneum.

The patients in which I have done this, have been convalescent in ten or twelve days, and have usually left the Hospital at the end of a fortnight. There has of course been no visible wound or scar and no necessity for any abdominal belt to mar the pleasure of their easy and complete recovery.

Anterior vaginal cœliotomy or, as it is sometimes called, "anterior colpotomy" has been extensively used during recent years in the treatment of peri-tubal hæmatocele due to tubal pregnancy. The vaginal vault is opened between the uterus and bladder, the vesico-uterine fold of peritoneum is divided, and the fundus is drawn forwards by volsella out of the abdomen through the opening thus made. The uterus and uterine end of the tube on either side are then under the complete control of the operator, and the tube together with any contained pregnancy can, as a rule, be ligatured and removed without much difficulty. But the space in which one has to work is cramped and confined, and while the tube may be easy to remove it is not so with the hæmatocele. This often separates from the tube with traction on the latter and it may be very difficult or impossible to remove it afterwards. Some operators appear to regard this as quite immaterial, and leave a considerable quantity of blood and blood-clot in the pelvis and abdomen at the close of the operation, providing no drainage, but trusting solely to the absorptive powers of the peritoneum itself for its removal. If the operation has been performed with perfect cleanliness this confidence may be rarely misplaced as regards the final result, but the patients do not recover easily, there being often considerable pyrexia for several days before convalescence is thoroughly established. The main objections to anterior vaginal cœliotomy as a routine method of treatment are the following:—(1) occasional insufficient space for operative work; (2) frequent inability to remove thoroughly and cleanly all products of the misplaced pregnancy; (3) inability to wash out the abdomen satisfactorily; (4) inability to drain through the anterior opening; and (5) occasional inability to extract the uterus without injury, the uterus being enlarged and softened by the changes consequent on the associated pregnancy. It may be noticed that most of these objections will lose a great deal of their importance if the operator, the patient, and her friends be prepared and ready to accept the possible sacrifice of the uterus in the course of the operation. If the uterus be already diseased or damaged, justifying its removal as an initial step, the space and opportunities thus acquired are ample for all ordinary requirements; there is room for thorough and careful work, the pregnancy and hæmatocele can be completely removed, the pelvis and lower abdomen may be washed out, and at the close of the operation the most perfect drainage of the pelvic peritoneum can be established by the adjustment of a well-fitting plug of iodoform gauze.

It is, of course, of considerable advantage to the patient to be able to relieve her of her disease without making an abdominal incision, and especially so in cases where drainage is a desideratum, abdominal drainage being frequently followed by hernia. But I am inclined to think that abdominal section, in spite of this drawback, is still the better operation, or rather the better route for operative work in every case in which a posterior colpotomy is inapplicable or insufficient. By abdominal section the extent and connexions of the hæmatocele can be accurately explored, the limiting adhesions to omentum and intestine can be carefully separated or broken through, and the whole of the operation from beginning to end can be performed under the most favourable conditions for manipulation and cleanliness. When operating by the median incision the diseased tube must be thoroughly defined, ligatured, and removed. It will often have to be unrolled from the back of the uterus after the main tumour of the hæmatocele has been taken away, but the adhesions are almost always light and easy to separate. The adhesions of the hæmatocele-capsule to bowel and omentum are, on the other hand, often especially intimate, and when this is the case, it is better practice to leave a considerable portion of the hæmatocele-capsule adhering to bowel than to make any attempt at their separation.

Sometimes a lateral inguinal incision may be of service, as in Case 40. It is quite possible to treat a large lateral hæmatocele—such as that depicted in fig. 42—in this way, without removal of the tube, and with but very little or no disturbance of the general cavity of the peritoneum. An incision is made above the groin, opening directly into the hæmatocele and pregnancy. The contents are removed without disturbing surrounding adhesions, and the cavity is packed with iodoform gauze.

A very similar method is advocated by Dr. Berry Hart for the treatment of anterior tubo-ligamentary pregnancy at mid-term and may be followed with advantage whenever the conditions permit of its application. In this pregnancy, as we have already seen, the anterior layer of the peritoneum is raised, and at mid-term as well as at a later stage there is a space either mesially or above the groin on one side which is uncovered by peritoneum. This can be accurately defined by a preliminary incision in the middle line which opens the abdomen. When this has been done a direct incision is made into the sac of pregnancy below the peritoneal reflexion. This extra-peritoneal wound should be large enough to admit four fingers. The fœtus is removed at once, the sac tamponaded with iodoform gauze, and the placenta allowed to separate and come away slowly with the discharge.

In tubo-abdominal pregnancy at term there is no difficulty in the removal of the child by an abdominal incision. The crux of the operation is the treatment of the placenta. If this be left, sooner or later it will almost certainly become septic and putrid, and I have come to the conclusion—contrary to the opinion I formerly held—that in all cases of true tubo-abdominal pregnancy it is wise to remove the placenta. A clear idea of its probable relations and attachments will, I feel sure, do much to make this part of the operation easier and to rid it of much of its otherwise alarming features. Wherever the placenta is, there is the Fallopian tube, and it is from this it receives the greater portion of its blood supply. As we have already seen, sometimes the placenta is still within the tube, absolutely surrounded everywhere by tube, and nothing can be easier than to ligature it off and ensure its complete removal without any loss of blood. When it is within the gestation-sac and mostly covered by reflexions of the amnion, no method, I think, can be better than that I employed in the case (No. 33) already reported under this heading. Accessory vascular attachments to the omentum or abdominal wall are first ligatured and divided, the placenta is slightly tilted up at the most accessible part of its circumference, and forceps are used to clamp its tubal attachments below. The placenta is then removed and the tubal attachments are subsequently ligatured. The most difficult and dangerous form of attachment is that when the amniotic membrane only lines the upper surface of the placenta and all its under surface is attached not only to the tube and broad ligament but also to the parts adjacent (the condition found in Case 3). Still in this case a modification of the plan already described will afford the best chance of success. Sometimes the deeper attachments (uterus and broad ligament) may be seized before separation by the fingers of an assistant. If not, the most accessible route to the under surface of the placenta is searched for and separation is begun. As soon as possible the tubal and uterine attachments are clamped by the lighter elastic forceps of Doyen, the placenta is peeled off and two or three large sterilised pads are packed into the cavity from which the afterbirth has been removed. Ligatures are applied to the broad ligament and tube, and wherever it is possible by so doing to control the bleeding. Where these are useless packing with iodoform gauze will prove, I believe, the best alternative method of control of hæmorrhage. When this is necessary, if the original abdominal incision—probably mesial—be decidedly to one side of the placental site, it will be wise to finish the operation by making a secondary abdominal incision immediately above the gauze, from which the packing may be readily removed some four or five days later. The very rare condition when the child is abdominal and the placenta intra-ligamentary belongs to a very different category. From a surgical standpoint this pregnancy remains tubo-ligamentary throughout, and is governed by the same laws of treatment which apply to tubo-ligamentary pregnancy.

In tubo-ligamentary pregnancy there is no necessity for the operative removal of the placenta. If the sac be drained the placenta will itself separate and come away with the discharges. This usually takes place without any pyrexia or constitutional disturbance. Let us take the simpler form of tubo-ligamentary pregnancy first—the posterior or retroperitoneal variety—and consider the operation necessary for its relief. In this the peritoneal cavity is always opened by the abdominal incision. Within the abdomen, full and bulging like a pregnant uterus, is the sac of pregnancy. This is opened by an incision directly underneath the abdominal wound, the edges of this are held against the edges of the abdominal incision, the child is extracted, and after ligature and division of the cord, is entirely removed. Now it may be possible to remove the placenta with safely from the interior of the sac, especially when the infant has been dead for weeks or months, and by so doing, if no serious hæmorrhage is occasioned, convalescence may be very much shortened. If there be any doubt, however, if the placenta be full of blood and firmly attached, no interference is necessary. The incision in the sac is sewn to the abdominal wound, the cord is left hanging out of its lower angle, and the sac is drained. I am aware that many modern writers have advised a much more radical and sweeping method of treatment. Dr. Dunning, in the case I have already quoted, proceeded to extirpate the sac, and very naturally, as anyone who studies the specimen depicted in fig. 25 will easily understand, had to complete his operation by removal of the uterus. Fortunately the patient recovered, but I cannot agree with the practice adopted. It is altogether unnecessary, and any temporary advantage secured by it is dearly purchased at the cost of increased danger and extensive mutilation. In the similar case reported by myself (Case 4) and treated by the simpler method of drainage, the patient not only made a good recovery but has since had a normal pregnancy with safe delivery of a healthy child. In the anterior or sub-peritoneal-abdominal form of broad ligament pregnancy the same remarks apply, but the sac may sometimes be opened at a part uncovered by peritoneum. If some part of the child is obviously almost subcutaneous (and that is most likely to be found on one side of the middle line) the sac may be opened at once and the operation of the removal of the child and drainage of the sac conducted without opening the abdominal cavity or seeing the peritoneal membrane. More frequently, perhaps, if the incision has been median, the peritoneal cavity will be opened at the beginning of the operation. If so the displacement of the peritoneum can be accurately estimated (as in the operation for mid-term ligamentary pregnancy) and a secondary incision can be made directly opening the sac, through which the child is removed and drainage established. The mesial exploratory incision is closed by suture.

In a few cases the sac of a tubo-ligamentary pregnancy may be so independent of the uterus as to be almost pedunculated, and when this is the case, the whole of the sac may be advantageously removed. Any adhesions to the omentum are ligatured and divided, the ovarian vessels are secured on the outer side of the pregnancy, the broad ligament between the sac of pregnancy and the uterus is ligatured and divided and the base of the pregnancy (if necessary) is enucleated from beneath the peritoneum. This is a good and clean operation but it is only very rarely that extirpation of the sac can be effected without sacrificing the uterus, and when the latter is healthy, its removal, as I have already stated, is an unnecessary procedure.

The vaginal method may sometimes be used with advantage in advanced tubo-ligamentary pregnancy of the posterior variety, especially when the placenta occupies the upper part of the sac and, from the abdominal aspect, roofs in the pregnancy. This practice was adopted with success by Dr. Donald in the treatment of his case already described on p. 135.

"On August 18th, 1898 (when the patient was between six and seven months pregnant) abdominal section was performed and the placenta was exposed. The wound was therefore temporarily covered and the child delivered through a posterior vaginal incision by cranioclasm and the sac packed from the vagina with iodoform gauze. Alarming hæmorrhage occurred when the gauze was removed on the fourth day. The separation of the placenta occupied some weeks but the patient made a good recovery and was discharged strong and well on Nov. 12th."

Now we can return to the consideration of the complicated form of pregnancy in which the child is abdominal and the placenta intra-ligamentary. The main indication in this form would be, as I believe, to convert the complex "tubo-ligamentary abdominal" pregnancy into a simple tubo-ligamentary one. After the fœtus has been removed this may, perhaps, be effected by sewing the laceration of the sac to the abdominal wound. If the opening in the sac be inconveniently situated for this the (divided) cord may be dropped inside the sac, the edges of the laceration turned in, and the abdominal opening in the sac closed by suture. Then, either before or after closure of the abdomen, a large opening is made by vaginal section into the most dependent part of the sac, the cord is drawn down into the vagina, and the rest of the wound and the lower part of the sac are plugged with iodoform gauze.

Finally, "utero-abdominal" pregnancy may demand very similar treatment or hysterectomy. The abdomen is opened, the cord is ligatured and divided and the fœtus is removed. Then, if the cervix be dilated or sufficiently dilatable, the divided cord may be returned through the utero-abdominal opening into the uterus and through the cervix out into the vagina. The placenta is delivered after it by manual expression and the opening in the uterus is "freshened" and sutured.

If this is impossible or deemed at the time to be inadvisable, the other alternative is to remove the uterus with its retained placenta. This may be done either by clamp or ligature, but the latter is preferable. In this condition there will probably have been no previous hæmorrhage, and if it be necessary to sacrifice the uterus, there is no reason against its complete removal by the modern method of abdominal hysterectomy.

CHAPTER XIV.

TREATMENT *(continued)*.

OPERATION-ACCESSORIES AND AFTER-TREATMENT.

IT is not, perhaps, enough to describe the operative treatment of extra-uterine pregnancy without further reference to the after-treatment of the case and the future care of the patient, the more especially as the necessities of an early tubal rupture and profuse internal bleeding may quite justify the operative interference of a surgeon who has no special acquaintance with abdominal surgery.

I will, therefore, as briefly as possible, touch upon those particulars of nursing and after-treatment which I have found of most importance in my own practice.

The room should be large, light, airy and thoroughly well heated, without draughts or smoke. If possible, it should have been recently cleaned and all superfluous furniture removed from it. No open drain from bath-room or otherwise should communicate with the room or its vicinity. The room is kept sacred to the treatment of the case. Unless the case be hopeless no one is admitted except the nurses and the doctor. After four days, if the case be doing well, the patient is allowed one visitor daily.

The bed should be a single one on a simple iron bedstead with woven wire mattress. On this there should be a good hair mattress and absolutely clean bed linen and blankets. A feather bed is inadmissible.

While the operation is in progress three or four hot water bottles should be wrapped in a small blanket and placed inside the bed. When the patient is replaced in bed the bed clothes are turned down while the hot water bottles are taken out of the blanket, the blanket wrapped round the patient and the bottles replaced beside her.

A large "cradle" reaching right across the bed is sometimes of service, especially when there is abdominal drainage.

At first the negative duties of nursing are of most importance. In ordinary cases such as after vaginal section, beyond the taking of the pulse half-hourly for the first six hours, and subsequently the 4-hourly record of pulse, temperature and respiration, nothing is to be done and nothing given to the patient but sympathy and encouragement as required. The holding of the head in sickness, arrangement of the pillows, and in simple cases the turning of the patient occasionally to one side, are, perhaps, all the duties required.

With the use of the catheter comes the first danger of nursing. A dirty catheter may cause foul cystitis and kill the patient. The catheter should be of glass, boiled after use and kept under water. If the surgeon is in doubt about the training and cleanliness of the nurse it is better not to use a catheter at all unless obliged to do so. But in this case he must be careful that any gauze dressing or ligatures are retained in the upper third of the vagina and cannot be soiled by voluntary micturition.

After 20 hours (or earlier, if there should be continued vomiting, increasing abdominal pain and any distension) a simple enema is given of soap and hot water. If this be successful and the patient passes flatus and motion, some water gruel is permitted by the mouth, and this, alternately with milk may be given through the day (one tablespoonful every two hours) so long as the bowels continue to act. The enemata are repeated every four or five hours until the motion returned is abundant: after this they are continued three or two times daily.

If the bowels refuse to act and the patient has a rising pulse, with or without green vomiting, and distension, turpentine enemata are given (turpentine ʒss, castor oil ℥j, soap and water to Oj) and these are repeated as often as every two or three hours. In addition, calomel (2-5 grains) is given in powder or tabloids and all nourishment is withheld until the bowels begin to act.

In most cases of vaginal cœliotomy the bowels are moved by the first enema. Considerable vigilance is required for four or five days, and in all but the simplest cases, the patient should not be left at all until the fourth day. Unless two nurses (day nurse and night nurse) have taken the case from the beginning, the nurse will probably require relief on the second night.

If the case be doing well from the outset, milk pudding may be allowed on the third day, fish on the fourth, chicken on the fifth. Cases slightly less rapid in their course towards convalescence may require to be one or even two days behind in this dietetic course.

In the more serious cases—such as those after profuse hæmorrhage—nutrient enemata are given from the beginning, brandy ʒss and beef-tea ʒiss, and brandy ʒss and milk ʒiss alternately, every six hours.

If these are well retained they may be given rather more frequently (4 hourly), and the amount of nutriment cautiously increased.

If the pulse be almost lost, the legs and arms may be temporarily bandaged and the foot of the bed may be raised.

In these cases the conduct of the drainage is an important matter and may be a special source of danger. The sucker is used every half hour at first, afterwards every two or four hours, as occasion requires. It is thoroughly cleaned in very hot water after each occasion of use and kept in clean water until again required. After each suction the sucker is emptied into an absolutely clean vessel and never into one already containing removed fluid.

The drainage tube is turned round several times after each "suckering" in order to keep it from any catching of the omentum.

The presence of a drainage tube need not prevent the use of a rather tight abdominal binder, but the abdomen must be built up on each side of the drainage tube by many pads of absorbent wool, and not simply by pads laid on the top of the tube.

There is little or no danger in the occasional exposure of the tube to the outside air, though it should be usually covered by a clean pad or iodoform gauze: there is every danger in putting a dirty sucker tube into the drainage tube and therefore inside the abdomen of the patient.

In a rather serious case the second night and third morning is the critical time. During this night enemata may be required every two hours, and there is considerable opportunity for a good nurse to shew her skill and ingenuity in their administration.

They are usually given most easily with the patient on her back. Occasionally this should be varied and the enema should be given while the patient is lying on her side.

After the enema is given gentle massage of the abdomen may assist in the passage of flatus. Midway between every two enemata a rectal (or vaginal) tube, well oiled, may be passed within the sphincter ani and allowed to remain there for a time. Motion and flatus will sometimes be passed in this way when no immediate result is obtained by the enema. About this time (the second evening and night) there is decided danger of neglecting the time for action when distension is increasing and the pulse is rising. Prompt and persevering effort will often save the patient's life. Five hours of inaction may sometimes sign her death warrant. A good nurse under these conditions does not wait for orders but gives repeated enemata on her own responsibility, and asks the surgeon as soon as possible whether this is to be supplemented by any—or further—administration of calomel.

Much, if not all, of what has been already written has its direct bearing on the action of the surgeon. At the same time there are certain cautions and directions which may be said to apply particularly to himself as head. So long as things are progressing favourably he must, like the nurse, exercise a wise repression. He must not order ice under any circumstances, nor anything by the mouth until there is some sign of movement from the bowels. He must not use hypodermics or morphia, and any food or stimulant if ordered at all must be ordered "per rectum." If the omentum be caught in the holes of the drainage tube he may be called upon to remove it. Should the accident be recent and the omentum only lightly held, the tube may be forcibly withdrawn, but before attending to it the surgeon thoroughly scrubs his hands and has sterilized scissors, forceps and fine ligature silk ready for use. Then, if on attempted withdrawal of the tube he finds it tightly held, he gently draws it further out until the fixed omentum is visible; a fine ligature is passed around this outside the tube, securely tied, and the little process of omentum passing through the hole is nipped across with scissors close to the drainage tube. If other processes are found these are treated in a similar way until the tube is free. The tube can generally be removed on the third day as soon as the bowels are open, and natural drainage by the intestinal tract can take the place of the drainage tube within the abdomen. If, on account of abundance of discharge, the tube be retained longer until the discharge becomes purulent and foul, it is better not to entirely remove it for several days but to change it for one of smaller calibre or replace it by a rubber tube. This can be passed to the bottom of the track inside the glass tube before the latter is withdrawn. Iodoform gauze when used as tampon and drain as in vaginal section demands no very exact time for its retention and withdrawal. It is very usual to remove it on the fifth day, by which time it has become loosened and is easily withdrawn, but it may remain for three or four days longer if there is no discomfort or rise of temperature. From twelve to twenty-four hours after removal of the gauze, the vagina should be gently douched with clean warm water (to which a little boracic acid or lysol may be added) and this should be repeated daily until the wound has healed.

The administration of calomel when there is any peritonitis is a matter demanding thought and carefulness. From $\frac{1}{10}$ to 5 gr. is the usual single dose after operation, and from 10 to 12 gr. the usual maximum quantity that can be given altogether. When the symptoms are acute—

vomiting, distension and inaction of the bowels—it is better to give five grains at once and to follow this up by lesser amounts of two grains or one grain until the maximum is reached. When the symptoms are much less marked and there is only perhaps a very little delay or difficulty in obtaining a good evacuation $\frac{1}{10}$ to $\frac{1}{2}$ gr. in tabloid form given every hour is often a better form of administration.

After abdominal section, when the stitches are removed (on the ninth and tenth day, if silkworm gut has been used for suture), the wound should be well supported by long strips of good adhesive strapping fixed across the incision from loin to loin. These should be renewed daily or oftener until the incision is soundly healed throughout.

After vaginal section the patient may very usually sit up in bed on the thirteenth or fourteenth day and be allowed to get out of bed on the following day. In abdominal section, where drainage has been used, the time of getting up must be largely governed by the healing of the wound and it is rare that a patient is fit for removal under a month from the date of operation.

A belt is always necessary after abdominal drainage. No mechanical support is necessary after vaginal section. In abdominal section, when there has been no drainage—a small abdominal incision and separate suture of the peritoneum and aponeurosis—a belt may often be dispensed with.

Many of the directions found in this chapter have now a somewhat ancient history. They have been adopted from the advice and practice of the older ovariotomists and notably from that of Mr. Tait, who was the first, I believe, to preach the gospel of purging for peritonitis. A few directions are entirely modern and are the outcome of a surgical enterprise and experience which was unknown to our predecessors.

CHAPTER XV.

ON THE RETAINED FŒTUS AND SECONDARY INFECTION OF THE PREGNANCY.

THE history of extra-uterine pregnancy in the past is remarkable for numerous examples of cases in which the pregnancy has been retained within the pelvis or abdomen of the mother for many months or even years. Over a dozen cases have been reported in which the pregnancy has been retained for more than twenty years, and in three or four instances the retention has lasted for fifty years or longer.

When this is the case considerable alterations take place in the pregnancy. The liquor amnii decreases and sometimes disappears; with this, the limbs are less easily moved and tend to form with the body a compact ovoid mass that has no special likeness to the limbs and trunk of a child. The head, though for a long time distinct from this, slowly consolidates or fuses into one with the larger mass. Around this, lime salts are deposited, forming a hard calcareous shell (lithopædion), and the tissues of the fœtus within are mummified or undergo a gradual fatty change or saponification, becoming converted into adipocere. Only the skeleton remains unaltered as conclusive proof that the tumour was originally a child.

The placenta is slowly absorbed and disappears, the fœtus shrinks in size and occupies half or less than half the space originally filled by the living pregnancy. Everywhere from the circumference the pregnancy recedes. It leaves its old relations and finally occupies a localized and circumscribed position very contracted and different from that which characterized the pregnancy at term.

It is important to recognise this because such pregnancies (of twenty or thirty years' duration) may slowly assume a position which is suggestive of a very different history.

A very good example of this is, I believe, afforded by a specimen—supposed to be one of ovarian pregnancy—very carefully described by Leopold of Leipzig, "in the Archiv f. Gynäkologie," B. 19, 1882.

The history of the patient from whom it was removed is as follows:—

Mrs. Z., aged 75, was eight times pregnant. Shortly after the fourth birth she conceived again, and manifested the diagnostic signs of extra-uterine pregnancy. She was then 40 years of age.

About term the fœtus appeared to die without causing much disturbance, and after this three children were born, each birth and lying-in being easy and normal. During all this time the tumour of the extra-uterine pregnancy (on the right side of the lower abdomen) became year by year harder and firmer, was recognised as a lithopædion, and caused the patient no pain.

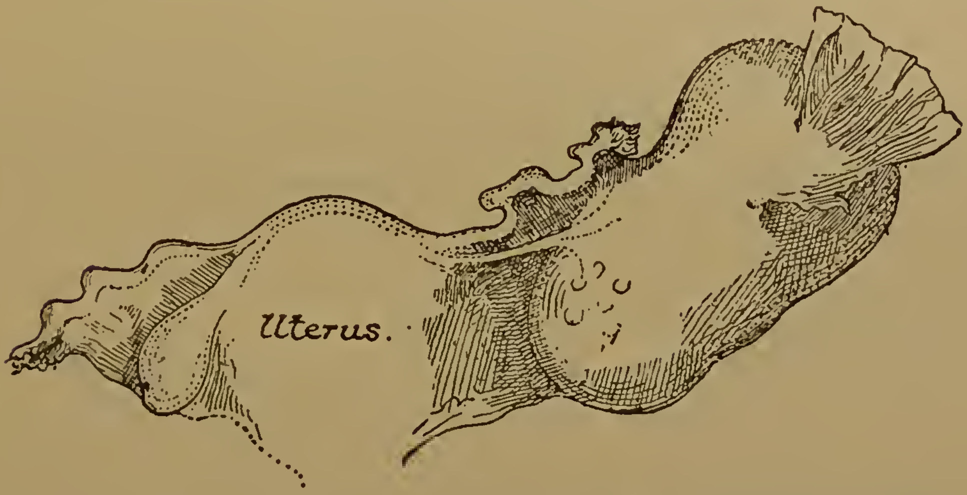

FIG. 63.—Lithopædion Tumour (after Leopold). "Ovarial Schwangerschaft mit Lithopädionbildung von 35 jähriger Dauer." *Arch. f. Gyn.*, B. xix., p. 210.

At the section the specimen was removed which is roughly depicted in the accompanying illustration.

Although 35 years had elapsed since the conception of the child the head, brain, body and limbs were intact and clearly recognisable. The head was lying in the part of the sac nearer the uterus, the back was applied to the lower border of the sac and the breech formed the larger protuberance at the outer portion of the sac. The placenta had entirely disappeared, for, in the section of the sac, although the position of the navel is pointed out (at the upper part of the pregnancy between the head and breech) no substance is recognised or marked as representing the placenta.

This being, as we have seen throughout, the essential key to the proper understanding of every extra-uterine pregnancy, its disappearance makes any conclusion regarding the original position and nature of the pregnancy largely a matter of opinion, and while this specimen answers better than any other I know of to the designation of ovarian—for it is in the position of the ovary, the right ovarian ligament passes directly to the sac and, if the illustrations are to be trusted, ovarian tissue is spread out over the head of the fœtus—yet it appears quite possible that this opinion is mistaken and that the pregnancy was originally a pedunculated tubo-ligamentary one and that the lesion of the tube has disappeared with the gradual disappearance of the placenta. If we compare this illustration with figs. 25, 28, and 29 we shall see what an important clue is lost in the disappearance of the placenta and how easily a broad ligament fœtus, after absorption of the placenta, might assume the position and relations depicted in Leopold's paper. The situation of the fœtus is suggestive; its abdomen is opposite or facing the Fallopian tube, and, if my theory be correct, it may have been originally connected with the tube by its umbilical cord and placenta.

Such is the history of a retained but quiescent fœtus*—a history of shrinking, consolidation and partial disappearance—a history that may be free throughout from any disturbing element, but one that is liable to a sudden and serious change—the change of decomposition.

How does decomposition arise? This comes from secondary infection of the pregnancy, through the intestinal tract, and is much more common in posterior "tubo-ligamentary" than in "tubo-abdominal" or pedunculated broad ligament pregnancy. In fact, the latter named pregnancies (after death of the fœtus) may be roughly characterized as "quiescent," and the late posterior tubo-ligamentary pregnancy as the decomposing, septic, or putrid one.

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* It may be possible to confound this condition with that of dermoid tumour. I have known the presence of a piece of bone plainly felt on bi-manual examination in the substance of a tumour to suggest the presence of a fœtal skeleton. In reality such detection of bone apart from any symptoms of acute suppurative inflammation is not indicative of extra-uterine pregnancy but is almost pathognomonic of a dermoid.

The reason for this is not far to seek. If the chapter on tubo-ligamentary pregnancy be thoroughly followed, and especially the section on the posterior or retro-peritoneal variety it will be seen that the rectum is in immediate relationship to the pregnancy without any intervening peritoneum. The latter has been lifted alike from the bowel and from the side of the pregnancy, and infective gases and bacteria can pass from the one to the other with but little "let or hindrance." Here, as in every other instance where sepsis may easily occur, the importance of the soil as well as of the germ is manifest. So long as the fœtus is living no infection takes place, but after the fœtus is dead decomposition and either (α) general toxæmia or (β) local suppuration may result. The former (general toxæmia) belongs rather to the early decomposition of the pregnancy while suppuration is more often a consequence of late infection.

A very good example of general blood-poisoning caused by a retro-peritoneal pregnancy with rigors, pyrexia, rapid emaciation and prostration was afforded (prior to the operation) by the case already described on page 76.

In this case, notwithstanding the severity of the general condition, there was no visible suppuration of the pregnancy, but the fœtus and liquor amnii were foul and the sac was deeply congested. The fœtus had been retained for three months after term, sapræmia had existed during the whole of this period.

An example of suppuration of the sac forming a large abscess is afforded by a somewhat recent case in the hospital practice of my colleague Mr. Martin, to whom I am indebted for the notes of the case and for permission to use them in this connection.

Mrs. A., aged 28, had been married 5 years, and menstruated regularly until 15 months ago, when she missed her periods for three months. About this date (*i.e.*, eleven months ago) an early miscarriage was supposed to have taken place, and subsequent to this the periods again became regular.

Five weeks before coming to the hospital (on September 8th, 1897) she had severe abdominal pain and diarrhœa, but no rigor. Since this date she has had night sweats and has been losing flesh. The diarrhœa continues, and the patient looks thin and pale. On examination a cystic tumour is found in the abdomen, rising out of the pelvis and comparable to the size of a six months' pregnancy (fig. 64). Per vaginam this tumour is found to pass behind the uterus, filling the pouch of Douglas and pressing the uterus forwards against the pubes (fig. 65).

The history and aspect of the patient and the character of the tumour suggested the presence of pus, and the patient was admitted into hospital for operation.

The sac was opened through the posterior vaginal fornix and found to be filled with horribly fœtid pus about the remains of a dead and decomposing fœtus. The latter (a macerated fœtus of about six months' growth), was extracted piece-meal, and after thorough evacuation of the sac this was packed with iodoform gauze. No trace of placenta was found. The patient made an excellent recovery.

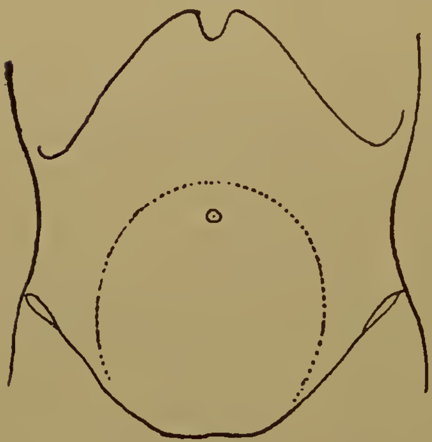

FIG. 64.

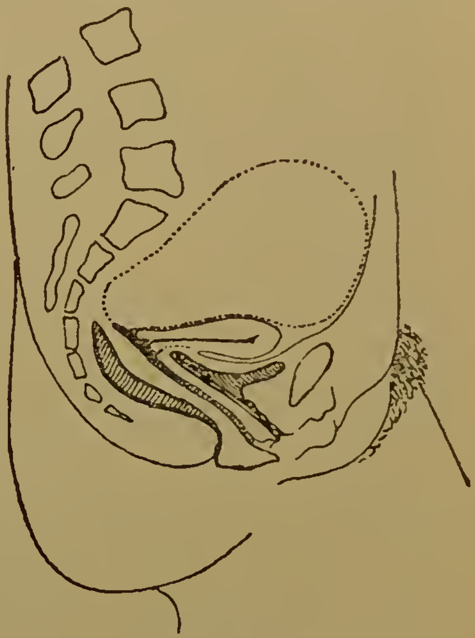

FIG. 65.

This case is of some importance as illustrating the clinical features and proper treatment of one class—or rather one complication—of extra-uterine pregnancy, "the retained and suppurating pregnancy," which until now I have not described. Its occasional occurrence in modern practice may be regarded rather as a survival from former times. As a matter of fact none of these cases of retained pregnancy are likely to maintain in the future the same importance that they have held—and justly held—in the past. As extra-uterine pregnancy becomes more generally understood, and the operative treatment more widely practised these cases will necessarily tend to diminish or even disappear from current records and practice.

This special class of case, however, the case of a foul and increasing abscess caused by a decomposing fœtus, remains, and will remain, an occasional result of extra-uterine pregnancy of the gravest import, and one in which the treatment may need the greatest care, ingenuity and perseverance. To begin with, the cause of the abscess is often unsuspected. The recent and acute origin of the inflammatory process and the severity of the symptoms following the infection may easily divert the mind from whatever antecedent history there may be pointing towards a pregnancy.

In the case I have reported no suspicion of a pregnancy was entertained until the abscess had been opened and the fœtus had been found and touched within the suppurating sac.

In the next place the point of surgical "attack"—the site of abscess-opening and evacuation—is of vital importance. The contents are putrid and deadly, and if a free exit can be obtained without opening the general cavity of the peritoneum, it is indispensable to choose this method of operating.

In case of uncertain diagnosis the valuable old rule of attacking an abscess at its nearest and most dependent part will usually lead one to right action. This was so in the case before us.

Finally, the focus and source of the continued suppuration—the putrid remains of the pregnancy—need thorough removal, or there will be no prospect of cure. So long as any parts—especially any bones—are left within the cavity, so long will suppuration continue and so long will there be danger of ulceration of the bones into neighbouring and important tissues. In many of the old cases these septic bones were allowed to ulcerate into the bladder and intestine, and in some cases they perforated the peritoneum causing fatal peritonitis. Perseverance, therefore, is needed in the finishing of the operation. All remains of the fœtus should be removed from the sac, the emptied sac should be thoroughly washed out and free drainage provided for by the use of iodoform gauze.

If the general cavity of the peritoneum has been opened in the course of the operation every care should be taken to prevent any soiling of it, and, at the close of the operation, the peritoneum should, if possible, be "shut off" from the sac by means of suture. If this be impossible it is doubly necessary to completely evacuate and cleanse the interior of the sac and to provide for efficient drainage (preferably from the vagina) whether the opening of the abscess have been by colpotomy or by abdominal section.

CHAPTER XVI.

On Repeated Extra-Uterine Pregnancy and its Lessons.

Extra-uterine pregnancy may be repeated on the same individual. Several cases of recurrence have been recorded and as, in many of these, the tube originally at fault had been removed on the first occurrence of the abnormal pregnancy, the second attack implies a general or double predisposition to ectopic gestation which is unmistakable and important.

Dr. J. Haig Ferguson, who has collected the literature of recurrence, in a paper published in the "Edinburgh Medical Journal" for February, 1899, estimates the frequency of this repetition at from four to five per cent. of all recorded cases, and judging from the very considerable number of cases (from 50 to 60) already well known, this must be very nearly correct. I have watched one case of recurrence in my own practice. This has already been recorded (on page 23). In this case both pregnancies occurred in the same tube, and both were followed by early rupture and dangerous hæmorrhage.

Another case in which both pregnancies took place in the same tube has been recorded by Dr. Coe ("Amer. Jour. of Obstetrics," vol. xxvii., p. 855). In this case the fœtus was well formed in each instance, and had advanced to about three months' growth. The resulting hæmorrhage was moderate in amount, and at the time of operation the recent fœtus was living, while that of the older pregnancy had formed a lithopædion.

In all other cases of repeated extra-uterine pregnancy the repetition has, I believe, been on the opposite side.

Professor Dührssen, of Berlin, records two of such cases ("Arch. f. Gyn.," B. 54, p. 259).

In the first case (F. Weber) he operated on Feb. 9th, 1895, for an incomplete tubal abortion of the right side, and on Nov. 17th, 1896, for an exactly similar condition of the left tube. In his operation list the condition found at the first pregnancy is entered as follows :—

"Abortus tubæ dextr. incompletus :—Grav. isthmica," and the condition at the second as :—

"Abortus tubæ sin. incompl. oder Tubermole. Grav. isthm."

His second case of repeated pregnancy is one in which he operated for diffuse hæmorrhage due to rupture of the right Fallopian tube on Oct. 6th, 1893. On Nov. 10th, 1896, after menstrual irregularity of over two months' duration, which he considers was probably due to another tubal pregnancy, the patient died with symptoms of internal bleeding.

In Dr. Ross's case ("Amer. Jour. of Obstet.," vol. xxxiii., p. 234) both pregnancies were attended with bleeding and collapse—at the first operation (on July 6th, 1891) the patient had gone three weeks over her period; at the second (on Oct. 10th, 1895) her period was two weeks overdue.

In the case of Dr. Reed's and Dr. Beck's ("Amer. Jour. of Obstet.," vol. xxvii., pp. 570 and 694) the first extra-uterine pregnancy terminated in rupture of the tube and acute hæmorrhage, and for this Dr. Reed operated on March 18th, 1891, removing the Fallopian tube of the side affected, presumably the left.

The second operation was performed by Dr. Beck on Aug. 26th, 1892. This operation was undertaken for intestinal obstruction complicating pregnancy. During its course the pregnancy was found to be a tubo-uterine one of over three months' duration on the right side of the uterus.

The muscular tissue covering it, which was very thin, was incised and the pregnancy removed.

The incision was closed by deep and superficial sutures.

There is a striking similarity between the history of this case and that of the case recorded by Mr. Tait in his book on "Ectopic Pregnancy" (p. 46).

In Mr. Tait's case, the first pregnancy was one of the right tube of three months' standing, which ruptured by a "large rent through which the fœtus and placenta were partly protruding." Dangerous hæmorrhage was caused by the rupture and at the operation the right Fallopian tube was removed. The second ectopic gestation (one normal pregnancy intervening) was the tubo-uterine pregnancy of the left side which I have figured on page 83. This ruptured between the fourth and fifth month with diffuse hæmorrhage, and the patient died.

In Dr. Ferguson's case, reported in the paper already referred to, the first pregnancy was of four months' duration when the patient was suddenly seized with violent abdominal pain on the right side. This was succeeded by a long and dangerous illness from which she finally recovered. Four years later another pregnancy occurred, evidently of the left Fallopian tube. This was removed by operation at about the third month of gestation. There was some recent rupture into the broad ligament, and just as the sac was touched (during operation) rupture into the peritoneal cavity. On the right side a small lithopædion was found, filled with the bones of a four months' fœtus attached to the tube by a fibrous pedicle and looking "as if it had been originally extruded through the peritoneal covering of the tube."

In Mackenrodt's case (quoted by Dr. Walter, "Brit. Med. Jour.," Oct. 1st, 1892) the patient, aged 32, was seized, in May, 1890, with symptoms indicating rupture of the gravid tube; operation was refused.

In October, 1891, she was again seized with the symptoms of rupture of a gravid tube. On this occasion the abdomen was opened and a gestation sac the size of a goose's egg removed from the left side. On the right side a second sac, surrounded by matted intestines, was found; it contained fœtal bones. The patient made a good recovery.

What strikes one about these histories (which have all been taken from easily accessible sources) is not only the fact of repeated extra-uterine pregnancy in the same patient, but the very remarkable similarity in type and course of the two pregnancies in each patient. We find two ruptures with diffuse bleeding or two moles or two pregnancies of about three or four months' growth. And this similarity is not apparently limited to the primary trouble occasioned by the pregnancy. A case is reported by Parry (Galiay, "Gaz. Med. de Paris," July 29th, 1837) of a woman who "conceived two extra-uterine children. In the interval between the two pregnancies the product of the first was evacuated through the rectum, after which she enjoyed good health for five or six years, when she conceived again. This child was also located outside the womb, and like the first, was finally discharged through the bowel, after which the woman regained her health."

Very similar, too, in its bearing is the interesting case of double tubal pregnancy recorded by Dr. Walter of Manchester ("British Medical Journal," Oct. 1st, 1892). This was really a case of repeated extra-uterine pregnancy because the history makes it quite clear that the tumours were not simultaneous in their appearance. It is true that in one a small fœtus had developed, while in the other there was placental tissue and an amniotic cavity without any visible fœtus, but so far as illustrations go, with this exception of the fœtus, the woodcuts depicting the pregnancies are almost interchangeable.

There is something in this similarity which will repay careful consideration and fuller investigation. It appears to me to be strongly confirmatory of the argument in etiology that there are several factors in causation, and that while in some patients, a disease affecting both tubes (such as atrophy or want of development of the tubes) may not only account for tubal pregnancy but lead on to rupture with diffuse hæmorrhage; so in others, some general disease, such as want of vitality in the impregnated ovum itself, may perhaps account for tubal mole, and some old pelvic peritonitis, causing fixity or distortion of otherwise well developed and healthy tubes, be responsible for such arrest and settling as may be accompanied by steady growth to three months or longer, with subsequent rupture or extrusion.

Some writers have argued with considerable force that because of the liability to repeated extra-uterine pregnancy in the same individual the proper course is to remove the appendages of both sides at the original operation. I should be loth to admit this as a general rule unless forced to do so by the unanswerable logic of facts.

Some causes or probable causes of ectopic gestation may be obviously one-sided (polypus, diverticulum, ovarian tumour, local adhesion), and if so, these should be treated by a one-sided operation. In many cases of tubal mole, with more or less chronic hæmatocele, a cure can be so easily effected by vaginal section that if the worst we have to fear be a 4% chance of the repetition of the same kind of trouble, a 4% chance of the same kind of operation to follow is not a very urgent or alarming thing to face.

With atrophy of the tubes, rupture and almost fatal hæmorrhage, the question of double removal assumes a much more important and practical aspect, and if both tubes be decidedly atrophic it may be wiser practice to remove both tubes at the operation undertaken for the hæmorrhage. The question, however, is not an easy one to decide, for early rupture and acute hæmorrhage often occur quite early in married life and the definite loss of any and every chance of maternity may be a greater trouble to the patient than the prospect of possible loss of life from hæmorrhage. Unless the feeling of the patient and her husband be definitely known beforehand it is better to limit the operation to the side of rupture. One of my own cases may be of interest as bearing on the possibilities of married life after operation for nearly fatal hæmorrhage due to rupture of the tube :—

Mrs. B., aged 27, had been married five years and had one child, a healthy boy, aged one year, when without any definite history of amenorrhœa, she was seized with abdominal pain. Some five days later signs of profuse internal bleeding came on, and when I saw her, on the night of May 11th, 1894, she was blanched with hæmorrhage and her abdomen was fluctuant with liquid blood.

With the assistance of a good nurse I operated at 1 a.m. on the morning of the 12th, finding an early rupture of the right Fallopian tube due to tubal pregnancy.

This tube and its corresponding ovary were removed. The patient made a good recovery.

About one year after this (in April, 1895) the boy, aged 2, died after a very short illness following an operation for circumcision.

The parents were now childless.

In August 1895, Mrs. B. again conceived, the pregnancy terminating in an early abortion at the end of September. Immediately following this another conception took place, and this pregnancy was carefully watched thoughout the whole period of gestation by myself. Another boy was born in July, 1896. The child is healthy and has passed through a circumcision successfully. He is now nearly three years old.

In February, 1899, I saw Mrs. B. again. She had had some irregular attacks of hæmorrhage from the vagina, but no proper menstrual period since October, 1898.

On examination I found she was about 4½ months' pregnant and the pregnancy again appeared to be within the uterus. During examination the movements of the fœtus were perceptible.

It must be remembered that any real or supposed incompetency in married life is apt to seize upon the imagination of the person affected with morbid or even fatal force, and especially so when the supposed cause is probably inherent in the patient herself and has been to some extent a matter of common conversation.

The occurrence of illness due to diffuse hæmorrhage from the rupture of an extra-uterine pregnancy is usually so sudden, necessitous and tragic, that there is no possibility of keeping the matter very secret from relations and friends, and even casual neighbours and acquaintances become more or less familiar with the details of the sudden seizure, the operation and the (possibly) successful issue.

In two or three cases of this kind I have found it of the very greatest advantage to be able, with a clear conscience, to assure the patient that the disease and the operation necessitated by it have carried with them no permanent disability—that the patient is practically as sound a wife as any other woman may be—that it is quite possible she may have future and healthy pregnancies and that the danger through which she has passed is due to an accident which, so far as we know at present, may occur to any married woman.

TABLE OF CASES.

TABLE OF CASES O

No.	Age.	Married.	Children.	Youngest.	Last menstruation.	Signs.	Symptoms.	Diagnosis.	Remarks.
1	38	—	2	12	11 weeks	Right side tumour	Pain and emaciation	—	Marked albuminuria
2	32	—	4	2	17 weeks	Tumour on left side and behind uterus	Pain on left side; irregular bleeding two months, after amenorrhœa two months; in bed four weeks	Tubal pregnancy	—
3	35	—	4	11	9 mths.	Child felt in abdomen; uterus empty, fœtal pulse very audible	Hæmorrhage and pain after 2 mths. amenorrhœa (time of rupture)	Abdominal pregnancy	—
4	36	6 yrs.	3	2	12 mths.	Large abdominal tumour	Septic; rigors; pyrexia; in bed for two months	Extra-uterine pregnancy with dead fœtus	—
5	44	—	4	5	8 weeks	Tubal tumour behind uterus	Constant loss for 8 weeks	Tubal pregnancy	—
6	33	—	1	7	5 weeks	Boggy mass in pouch of Douglas	Symptoms of internal bleeding; abdominal pain; pulse 135	Ruptured tubal pregnancy	—
7	39	Second time for 8 yrs.	4	13	(?)	Fixed tender cyst behind uterus	Irregular loss for 3 months	Ovarian cyst	—
8	26	7 yrs.	1	6	2 mths.	Small painful tumour behind uterus	Amenorrhœa 5 weeks followed by loss for 3 weeks; abdominal pain and pain on defæcation	Tubal pregnancy	—
9	39	17 yrs.	5	11	14 weeks	Tender tumour in pouch of Douglas; uterus retroflexed	Amenorrhœa 5 weeks followed by loss for 9 weeks; abdomen distended and tender; legs drawn up	Ruptured tubal pregnancy	Slight albuminuria
10	31	3 yrs.	2 miscarriages	—	10 weeks	Mass to right of pubes; pouch of Douglas distended	Sudden repeated attacks of abdominal pain	Ruptured tubal pregnancy	Slight albuminuria
11	37	Nearly 11 yrs.	1	10	9 weeks	Mass in Douglas' pouch reaching above pubes	Amenorrhœa 6 weeks followed by irregular loss and pain and latterly pyrexia; temperature from 99° and 101·4° to 104·8° F.	Ruptured tubal pregnancy; hæmatocele	Took herbs to bring on abortion

EXTRA-UTERINE PREGNANCY.

No.	Medical Attendant.	Date of Operation.	Place.	Present.	Particulars.	Sequel.
1	Mr. Barratt	March 7th, 1888	Women's Hospital, Birmingham	Dr. S. T. Ricketts (U.S.A.) and Dr. A. Clark	Large fœtus and placenta (from 3 to 4 months)	Left hospital March 28th; recovery
2	Dr. Lynes	June 14th, 1890	Do.	Mr. F. H. Maberly, Dr. Baker, and Dr. Eccles (U.S.A.)	Large unruptured tube containing mole	Left June 28th; recovery
3	Dr. Lycett	June 24th, 1890	Wolverhampton Hospital for Women	Dr. Lycett, Dr. C. Smith, and Dr. Hubbersty	Removal of child; removal of placenta	Left Oct. 4th; recovery
4	Dr. Cook	Feb. 27th, 1891	Private Hospital	Dr. L. Phillips and Dr. Robinson (U.S.A.)	Cyst of Pregnancy sewn to incision	Left April 10th, 1891; recovery; subsequent normal pregnancy and good delivery
5	Dr. D. C. Martin	July 13th, 1891	Women's Hospital, Birmingham	Dr. Bull and Dr. Melson	Right tubal mole, unruptured, in middle portion of tube; abdomen reopened for obstruction	Left July 25th; recovery
6	Dr. Bernays	Jan. 29th, 1892	Patient's Home	Dr. Bernays and Dr. Phillips	Left tube ruptured, removed; diffuse hæmorrhage	Recovery
7	J. W. T.	April 20th, 1892	Women's Hospital, Birmingham	Dr. Melson	Right tubal pregnancy, with encapsulated hæmatocele (unruptured)	Left May 8th; recovery
8	J. W. T.	July 4th, 1892	Do.	Dr. Phillips	Right tubal mole; tube unruptured; hæmatocele partly encapsulated	Left July 18th; recovery
9	Dr. Holdsworth	Sept. 15th, 1892	Do.	Dr. Phillips	Right tubal pregnancy removed; free hæmorrhage; tube unruptured; rupture of hæmatocele	Left Oct. 8th; recovery
10	Mr. H. H. H. Addenbrooke	Oct. 11th, 1892	Do.	Dr. Phillips, Dr. Williams, Dr. Edge, Dr. De la Cbérois, and Mr. Addenbrooke	Right broad ligament pregnancy; free bleeding; pulse 156	Left Nov. 13th; recovery
11	Dr. Fitzpatrick	Jan. 6th, 1893	Private Hospital	—	Vaginal section and clearing out; drainage	Left Jan. 23rd, 1893; recovery

TABLE OF CASES OF EXTRA-

No.	Age.	Married.	Children.	Youngest.	Last menstruation.	Signs.	Symptoms.	Diagnosis.	Remarks.
12	27	4 yrs.	2; 1 miscarriage	7½ mths.	(?)	Tender hard mass behind uterus	Sudden abdominal pain 5 weeks before, followed by irregular loss; no amenorrhœa	Ruptured tubal pregnancy	—
13	23	4 yrs.	0	—	7 weeks	Fixed tense elongated tumour behind uterus	Ill 10 weeks with abdominal pain	Tubal	—
14	32	14 yrs. (second time for 5 yrs.)	2 (premature)	6	9 weeks	Mass behind uterus reaching above half way to umbilicus	Sudden severe abdominal pain 10 days before operation; continuous loss for 9 weeks	Ruptured tubal pregnancy	Trace of albuminuria
15	25	1½ yrs.	1	5 mths.	5 weeks	Mass to left of pubes and behind uterus, tender, fixed	Loss for 5 weeks; seized with sudden pain 2 weeks ago; "bent double with it"	Ruptured tubal pregnancy; hæmatocele	—
16	32	7 yrs.	0	—	(?)	Hard mass to right of uterus	Irregular loss for 3 months	Myoma	—
17	27	5 yrs	1	1	5 weeks	Small mass behind uterus; abdomen distended, soft, fluctuating	Irregular loss for 5 weeks; acute seizure of abdominal pain 6 days before operation; much worse for 12 hours	Ruptured tubal pregnancy	Mitral regurgitation murmur first noticed after operation
18	39	6 yrs.	2	3	"Regular"	Large round cyst, reaching above pubes in front of uterus	"Inflammation 3 years ago"; an acute attack of abdominal pain and sickness 2 weeks ago	Ovarian cystoma	—
19	27	½ year	1 miscarriage 3 mths. ago	—	(?)	Large tender mass behind and to left of uterus	Pain in left side ever since miscarriage; unable to walk or work	Tubal pregnancy	—
20	27	8 yrs.	3	4	11 weeks	Mass left, lateral, *in front of* uterus, extending above left groin	Violent abdominal pain 9 weeks ago; pain ever since preventing sleep	Tubal pregnancy and hæmatocele	—

Uterine Pregnancy—*(continued).*

No.	Medical Attendant.	Date of Operation.	Place.	Present.	Particulars.	Sequel.
12	Mr. Jephcott	Jan. 19th, 1893	Private Hospital	Dr. Phillips	Right tubal pregnancy removed; tube itself unruptured; rupture of hæmatocele	Left Feb. 3rd; recovery
13	Dr. T. A. Brown	June 6th, 1893	Women's Hospital, Birmingham	Dr. Phillips, Dr. Martin, Mr. Jordan, and Dr. Collins	Unruptured mole of left tube removed; hæmatocele	Left June 27th; recovery
14	Dr. S. S. Dunn	July 15th, 1893	Do.	Dr. Phillips, Dr. Martin, Mr. Jordan, and Dr. S. S. Dunn	Right tubal pregnancy removed; tube itself unruptured, but recent rupture of large hæmatocele about fimbriated end of tube	Left Aug. 2nd; recovery
15	Dr. A. Clark	Jan. 30th, 1894	Do.	Mr. Jordan and Dr. Edge	Left tubal mole and hæmatocele with peripheral adhesions; mole at outer end of tube; rupture of tube, clot protruding	Left Feb. 19th, 1894; recovery
16	Mr. J. J. Hues	Feb. 15th, 1894	Do.	Mr. Jordan and Dr. Martin	Old right tubal pregnancy unruptured	Left March 1st; recovery
17	Dr. O. Shaw	May 12th, 1894 (1.0 a.m.)	Patient's Home	—	Right tube (ruptured) removed; diffuse hæmorrhage	Recovery; subsequent normal pregnancy; delivery July 8th, 1896
18	Dr. Cranstoun	Sept. 4th, 1894	Private Hospital	Mr. Jordan	Right ovarian dermoid; left tubal pregnancy (unsuspected); fœtus well formed	Left Oct. 5th; recovery
19	Mr. Clarkson	Dec. 1st, 1894	Do.	Mr. Jordan	Left tubal pregnancy and hæmatocele; peripheral adhesions; tube probably unruptured; fimbriated end widely opened out	Left Dec. 19th; recovery
20	Dr. Purslow	Dec. 14th, 1894	Women's Hospital, Birmingham	Mr. Jordan	Left tubal pregnancy; mole, hæmatocele; large tube distended throughout with blood and blood clot; fimbriated end very thin but unruptured; bleeding mainly confined by adherent omentum	Left Jan. 2nd, 1895; recovery

TABLE OF CASES OF EXTRA-

No.	Age.	Married.	Children.	Youngest.	Last menstruation.	Signs.	Symptoms.	Diagnosis.	Remarks.
21	31	11 yrs.	1	10	14 weeks	Mass on right side of lower abdomen and behind uterus, tender, fixed	Abdominal pain, vomiting, and distension	Tubal pregnancy; hæmatocele	Some albuminuria and jaundice
22	32	13 yrs.	1	12	14 weeks	Large hard mass on left side of abdomen above left groin and in pouch of Douglas	Abdominal pain, in bed 6 weeks; history of 3 falls (2 in street)	Tubal pregnancy; hæmatocele	—
23	30	10 yrs.	1; 1 miscarriage 5 years ago	9	5 weeks	Boggy mass in Douglas' pouch; abdomen distended	Blanching; pulse 150; symptoms of internal bleeding	Ruptured tubal pregnancy	—
24	35	—	1	14	6 weeks	Mass above pubes and behind uterus	Abdominal pain for 1 month preventing sleep; loss for 6 weeks	Tubal pregnancy	—
25	30	½ year	0	—	4 weeks	Boggy mass filling pouch of Douglas; abdomen distended	Symptoms of internal bleeding; blanching; abdominal pain; pulse 120	Ruptured tubal pregnancy	—
26	35	14 yrs.	2; 1 miscarriage 8 years ago	12	8 weeks	Hard, tender mass behind and to right of uterus	Abdominal pain, worse on sitting; temperature 100° F.	Tubal	—
27	42	18 yrs.	6	7	3 months	Mass to right of and behind uterus	Great pain in lower abdomen and pelvis for 6 weeks	Tubal pregnancy	—
28	28	7 yrs.	2	4¾	8 weeks	Mass behind and to right of uterus	Abdominal pain getting worse for 1 month; unable to do anything	Tubal pregnancy	—
29	40	19 yrs.	6; 3 miscarriages, last 6 years ago	8	Irregular	Cystic mass behind and to right of uterus; hard lump below this	Pain in abdomen, worse on walking or defæcation	Right ovarian cystoma	—

No.	Medical Attendant.	Date of Operation.	Place.	Present.	Particulars.	Sequel.
21	Mr. Greene	Jan. 27th, 1895	Stratford Hospital	Mr. Greene, Dr. Nason, and Mr. Lupton	Right tubal pregnancy and hæmatocele; removal; tube ruptured; 3 months' fœtus well developed	Left March 18th; recovery
22	Mr. Clarkson	March 23rd, 1895	Women's Hospital, Birmingham	Mr. Jordan and Dr. Edge	Right tubal pregnancy, ruptured, and hæmatocele removed	Left April 16th; recovery
23	Dr. Shillito	July 15th, 1895	Patient's Home	Mr. Jordan and Dr. Shillito	Left tubal pregnancy; early rupture near uterus; large vessels; both appendages removed; right ovary cystic	Recovery
24	Mr. Wood	July 18th, 1895	Women's Hospital, Birmingham	Mr. Jordan	Ruptured broad ligament pregnancy; hæmatocele cleared out and drained; big hole in ligament	Left Aug. 17th; recovery
25	Dr. Littleton	Nov. 30th, 1895	Patient's Home	Mr. Gamgee and Dr. Littleton	Left tubal pregnancy; early rupture close to uterus; abdomen full of blood	*Died Dec. 17th*
26	Dr. T. A. Brown	Dec. 3rd, 1895	Private Hospital	Dr. T. A. Brown and Mr. Jordan	Broad ligament pregnancy and hæmatocele; vaginal incision as well as abdominal section	Left Dec. 26th; recovery
27	Dr. Welsh	Dec. 31st, 1895	Women's Hospital, Birmingham	Mr. Jordan	Right tubal mole and hæmatocele; tube unruptured; typical specimen with rosette of fimbriæ at bottom of hæmatocele	Left Jan. 20th, 1896; recovery
28	Dr. A. Clark	Feb. 1st, 1896	Do.	Mr. Jordan and Dr. Martin	Ruptured broad ligament hæmatocele; free blood in abdomen; big hole in ligament to right of uterus; cleaned out and drained	Left Feb. 14th; recovery
29	Mr. Addenbrooke	Feb. 28th, 1896	Do.	Mr. Jordan and Mr. Savage	Cyst of right ovary with ruptured pregnancy of right tube; rupture size of a sixpence quite at uterine end	Left March 24th recovery

TABLE OF CASES OF EXTRA-

No.	Age.	Married.	Children.	Youngest.	Last menstruation.	Signs.	Symptoms.	Diagnosis.	Remarks.
30	39	15 yrs.	7	1¼	(?)	Large mass behind uterus, not adherent	Irregular loss for 7 weeks; 5 or 6 attacks of abdominal pain	Tubal pregnancy and hæmatocele	Patient suckling up to time of admission
31	23	3½ yrs.	2	1	10 weeks	Cystic mass to left of uterus with hard lump at highest part	Amenorrhœa 5 weeks followed by irregular loss: pain in left side of abdomen and rectum	Left ovarian cystoma or tubal pregnancy	—
32	27	7 yrs.	3	1½	4 months	Hard mass on left side of lower abdomen, one with uterus	Continuous loss for 4 months; severe abdominal pain for some weeks; acute pain 4 days	Tubal pregnancy	—
33	27	9 yrs.	4	4	12 mths.	Child felt in abdomen; uterus empty	Losing for 7 weeks; passage of decidua 5 weeks ago	Abdominal pregnancy	
34	36	—	—	—	10 weeks	Mass in lower abdomen and behind uterus, very tender; distension	Symptoms of internal bleeding, vomiting, faintness	Ruptured tubal pregnancy; hæmatocele	—
35	37	8 yrs.; 1 year	1; 2 miscarriages, last 5 mths. ago	7	7 weeks	Left lateral tumour pushing uterus to right; tender, fixed	Abdominal pain; temperature from 99° to 100° F.; amenorrhœa 5 weeks followed by irregular loss	Tubal pregnancy with hæmatocele	Married twice; 2nd time one year only
36	27	9 yrs.	2	—	10 weeks	Ill defined tumour felt above right groin, pushing uterus to left	Losing for 4 weeks; symptoms as of ordinary miscarriage at first; cervix dilated by medical attendant; severe abdominal pain afterwards	Right tubal pregnancy	No history of decidua
37	37	17 yrs.	6	—	(?)	Tumour attached to left side of uterus at fundus	Losing for 7 weeks; sent into hospital as case of uterine cancer	Myoma	Laceration and hypertrophy of cervix

UTERINE PREGNANCY—*(continued).*

No.	Medical Attendant.	Date of Operation.	Place.	Present.	Particulars.	Sequel.
30	Mr. J. D. Price	April 22nd, 1896	Women's Hospital, Birmingham	Mr. Jordan and Mr. Price	Ruptured right tubal pregnancy; hæmatocele with peripheral adhesions; removal	Left May 8th; recovery
31	Mr. Trout	May 8th, 1896	Do.	Mr. Jordan	Cyst of left ovary with tubal pregnancy perched on top; tube unruptured	Left May 23rd; recovery
32	J. W. T.	Sept. 10th, 1896	Do.	Mr. Jordan and Dr. Edge	Early interstitial pregnancy; left cornu of uterus and tube dilated into large blood sac; ligatured off from the uterus in four sections	Left Sept. 28th; recovery
33	Mr. Clarkson	Dec. 11th. 1896	Do.	Mr. Jordan and Dr. Martin	Child and placenta removed	Left Jan. 26th, 1897; recovery
34	Dr. T. A. Brown	Jan. 22nd, 1897	Patient's Home	Mr. Jordan and Dr. T. A. Brown	Left tubal pregnancy; very large mole at extreme outer end of tube; tube probably unruptured; free hæmorrhage into abdomen	Recovery
35	Mr. Tighe	Feb. 13th, 1897	Private Hospital	Mr. Jordan and Mr. Tighe	Left tubal pregnancy with encapsulated hæmatocele; rupture of tube; pregnancy near uterine end	Left March 7th; recovery
36	Mr. Clarkson	Oct. 25th, 1897	Women's Hospital, Birmingham	Mr. Jordan	Tube ruptured placenta protruding	Left Nov. 15th; recovery
37	Mr. H. K. Bradbury	Dec. 15th, 1897	Do.	Mr. Jordan	Vaginal section and vaginal hysterectomy; removal of pregnancy; tube unruptured; bleeding from abdominal ostium	Left Jan. 1st, 1898; recovery

TABLE OF CASES OF EXTRA-

No.	Age.	Married.	Children.	Youngest.	Last menstruation.	Signs.	Symptoms.	Diagnosis.	Remarks.
38	29	2½ yrs.	1	1⅓	9 weeks	Soft globular swelling to left of and behind uterus	Amenorrhœa 6 weeks followed by loss for 2 weeks, free from loss for 10 days; 2 attacks of acute abdominal pain	Tubal mole and hæmatocele	—
39	36	8 yrs.	2 miscarriages	—	15 weeks	Globular mass to left of uterus, uterus fixed	Amenorrhœa 10 weeks followed by 3 floodings; 5 weeks, 3 weeks and 1 week ago	Left tubal pregnancy	Membrane expelled 5 wks. ago
40	40	24 yrs.	2 2 miscarriages, last 16 yrs. ago	21	17 weeks	Large fixed tumour of right side rising out of pelvis above groin and extending nearly to umbilicus; uterus pushed to left	Amenorrhœa 9 weeks followed by irregular loss for 2 months. "Fainting fits"	Broad ligament or tubal pregnancy	Pieces of membrane came away 4 weeks ago
41	38	20 yrs.	9	4	9 weeks	Elastic tumour behind uterus very like gravid retroflection; uterus pushed against pubes	No amenorrhœa, irregular loss for 5 weeks; severe abdominal pain for 3 weeks	Tubal pregnancy	Difficulty in passing urine
42	36	7 yrs.	0 never pregnant until now	—	14 weeks	Mass to left of uterus, pushing uterus to right, hard, globular, rising into abdomen and extending half way to umbilicus.	Amenorrhœa 6 weeks followed by irregular loss for 8 weeks; regular previously; abdominal pain and vomiting 8 weeks ago, lasted 5 days	Left tubal pregnancy	Bits of skin passed 8 weeks ago

Uterine Pregnancy—*(continued).*

No.	Medical Attendant.	Date of Operation.	Place.	Present.	Particulars.	Sequel.
38	Mr. J. Tighe	June 27th, 1898	Women's Hospital, Birmingham	Dr. Sturge	Posterior vaginal section; tubal mole removed; tube not removed; gauze tampon and drainage	Left July 9th, 1898; recovery
39	Mr. W. Rennie	Sept. 16th, 1898	Private Hospital	Mr. Jordan and Dr. Edge	Posterior vaginal section; tubal mole removed; tube not removed; gauze tampon and drainage	Left Oct. 4th, 1898; recovery
40	Mr. C. H. Lowe	Sept. 22nd, 1898	Women's Hospital, Birmingham	Mr. Jordan and Dr. Sturge	Right inguinal incision: pregnancy of right tube with large peri-tubal hæmatocele opened above groin; blood-clot and placental debris evacuated; no fœtus; gauze packing	Left Oct. 15th, 1898; recovery
41	Mr. E. F. Page	Nov. 15th, 1898	Do.	Mr. Jordan and Dr. Sturge	Posterior vaginal section; right tubal pregnancy; mole of pregnancy, right tube and right ovary removed; washing out; gauze drainage	Left Nov. 30th, 1898; recovery
42	J. W. T.	Dec. 17th, 1898	Do.	Mr. Jordan and Dr. S. Savage	Posterior vaginal section; left tubal pregnancy cleared out by fingers, forceps and irrigation; tube not removed; gauze drainage	In hospital at time of printing

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